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INTERNATIONAL TELECOMMUNICATIONS
AND INFORMATION POLICY: SELECTED
ISSUES FOR THE 1980's

A REPORT

PREPARED FOR THE
COMMITTEE ON FOREIGN RELATIONS
UNITED STATES SENATE

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LETTER OF TRANSMITTAL

UNITED STATES SENATE,
COMMITTEE ON FOREIGN RELATIONS,
Washington, D.C.

To the Members of the Committee on Foreign Relations:

International communications and information has become an area of vital national interest to the United States. It may also increasingly become a source of significant foreign policy disputes. The problems stem from several developments of recent years:

- the rapid growth of international telecommunications into a multi-billion dollar business;
- the trade and industrial policy conflicts that develop as every major country tries to make information processing and telecommunications one of its leading sectors;
- the efforts by many governments to restrict the flow of information and communications across their borders and to discriminate in favor of domestic industries;
- the growing opportunities to expand the role of private competitors in the international telecommunications markets;
- the potentially disruptive effect of new entrants on the delicate international regulatory and operating regime which may become politicized and polarized; and
- the danger that a breakdown in the international consensus would lead to a stalemate, with serious commercial, economic, and diplomatic consequences for the United States.

These problems suggest that we must proceed skillfully if we are to reap the gains of competition and enhance the competitive position of the United States in this key area, while preserving important foreign policy objectives.

The following report, prepared by Jane Bortnick of the Congressional Research Service, is a highly valuable study of the issues involved and should provide a useful background document for the Committee's future deliberations.

Sincerely,

CHARLES H. PERCY,
Chairman.

LETTER OF SUBMITTAL

CONGRESSIONAL RESEARCH SERVICE,
THE LIBRARY OF CONGRESS,
Washington, D.C., July 11, 1983.

HON. CHARLES PERCY,
Chairman, Committee on Foreign Relations,
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: I am pleased to submit this report entitled, "International Telecommunications and Information Policy: Selected Issues for the 1980's" prepared at the request of the Committee on Foreign Relations.

This report provides an analysis of the major issues facing Congress in the area of international telecommunications and information and offers an overview of the interrelationship between the various policy elements. The introduction highlights the complexity of the issues involved, as well as the changing domestic and international environment effecting information and telecommunications development. This is followed by sections focusing on specific issue areas, including global structure, international competitiveness, U.S. Government structure, transborder data flows, spectrum management, and the developing countries.

The report was prepared by Jane Bortnick, Specialist in Information Science and Technology, Science Policy Research Division. Michael Cassella, Analyst in Science and Technology, contributed the selected references. Production support was provided by Kaseem C. Hall and Terrence L. Lisbeth, under the supervision of Shirley S. Williams.

We hope that this report will serve the needs of your committee and appreciate the opportunity to perform this challenging assignment.

Sincerely,

GILBERT GUDE, *Director.*

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I. INTRODUCTION

International telecommunications and information issues are receiving increased attention in the United States as policymakers grapple with the effects of rapid technological developments, evolving market structures, new domestic policies, and an increasingly varied array of foreign government policies and initiatives. This changing environment raises a host of questions about how the United States can assure the greatest benefits for its economy and society from modern telecommunications and data processing technology while maintaining its technical and economic leadership.

Legislative initiatives will play a key role in determining how this Nation responds to the evolving "information society." Congressional actions will set the direction of United States policies, help establish priorities, and continue to identify foreign actions which should be supported or opposed. In the years ahead, multilateral and bilateral exchanges, whether in international organizations or elsewhere, will set a new agenda reflecting the changes brought by information technologies. The success of the United States in assuring that this new agenda benefits this Nation may be determined to a considerable extent by the type of action taken by Congress on these issues.

The stakes involved are substantial. The information industries have become one of the United States' single largest economic sectors and continue to grow at a consistent and healthy rate. More important, however, data processing, telecommunication, and other information technologies provide the underpinning for increased productivity and expansion in other industries and for continuing overall economic development.

Actions being taken today and over the next several years by foreign governments and in a wide range of international arenas will determine future opportunities and constraints in exploiting the economic and social potential of information technologies. In effect, these decisions will create "winners" and "losers" and set the rules for playing the international information "game." Furthermore, as discussed in more detail later, the perspective of the United States often differs considerably from that of other countries. Our ability to influence the agenda-setting and rule-making process to reflect this Nation's policies and priorities will be critical in determining how the United States fares in maintaining a leadership position.

If the United States is to promote its interests and influence the new international telecommunications and information regime successfully, it may no longer be able to rely on the status quo. It may be increasingly important to propose new and innovative approaches which reflect the changing technological, economic, and political environment, rather than play a primarily reactive role.

A. COMPLEXITY OF ISSUES

The complexity and interrelationship of the issues involved makes formulation of effective international telecommunications and information policies a difficult task. The fact that various policies are often competing further complicates any attempt to analyze international telecommunications and information issues. For example, in the case of formulating proposals for transferring information technology to developing countries, U.S. officials may have to evaluate and prioritize policies for industry and trade, foreign affairs, national security, information collection and dissemination, research and development, and cultural development. Yet, even within these individual categories issues are often ill-defined and there are no firm policy directives. At the same time, the existing legal framework, regulatory environment, and technical advancements often define the limits and dictate the direction of policy formulation.

The interdisciplinary nature of international telecommunications and information issues creates a cumulative set of problems for United States policymakers. First, there is a need to understand and develop expertise in a number of diverse topics, an increasingly difficult task in an era of high specialization and decentralization of functions. In addition, reliable data required to make decisions often are lacking. Second, a substantial and growing number of players have a stake in the outcome of decisions on international telecommunications and information policies. These players often represent competing interests, or at a minimum, divergent perspectives, and hope to achieve different goals. Third, the number of issues involved and their diverse nature necessitate the determination of trade-offs and designation of priorities. Effective and coherent judgments on these questions often prove difficult where, as in the United States, authority is dispersed and the private sector plays a major role.

B. TECHNOLOGICAL DEVELOPMENTS

The rapid advance of telecommunications and data processing technologies creates new opportunities for economic growth and provides for a broad array of new products and services. In the area of computers, developments in microelectronics makes possible increased capabilities and greater speed of operations at significantly reduced costs. For example, "a computation which costs \$1.00 today, would have cost \$28,000 in 1950," while at the same time, operating speeds have multiplied and component sizes have drastically decreased.¹ New storage devices greatly increase computer capacity and improvements in software now make computers accessible to large numbers of users without technical training.

In the field of telecommunications, better use of the electromagnetic spectrum is now possible at reduced costs as well. The capacity of a communications satellite today compared to 15 years ago "has increased by a factor of 50 and the cost per circuit-year has decreased by a factor of about 45."² New switching technologies, advances in fiber

¹ U.S. Congress. House. Committee on Science and Technology. Subcommittee on Science, Research and Technology. The Information Science and Technology Act. Hearings on H.R. 3137, 97th Cong., 1st Sess., May 27, 28, and June 9, 1981. Washington, U.S. Government Printing Office, 1981, p. 70. Committee Print No. 97-25.

² Ibid.

optics, and developments in microwave technologies provide further potential for enhanced telecommunications capabilities and systems.

The interaction of the two technologies, however, provides the greatest opportunities for new developments, products, and services. At the core of today's telecommunications networks are computer-controlled electronic switches. Similarly, distributed computing facilities are now linked through extensive telecommunications lines. Most importantly, this merger of technologies leads to new and improved capabilities which can be applied in innovative ways. Electronic message systems, videotext, and direct broadcast satellites provide examples of these new "hybrid" systems, which often involve improved video technologies as well.

The consequences of these technical developments are considerable. Modern technology diminishes the traditional obstacles of distance. Communication is possible on a worldwide basis, altering the way business is conducted and products produced. Systems can be truly global in nature, making it viable to enter new markets and offer new services. At the same time, old definitions no longer are valid, new standards must be devised, and changes must be made to accommodate the new technology. The rapid pace of innovation further complicates this adjustment process. Because technological development can occur at an explosive rate, leadership in specific areas may shift in a short time frame. In addition, the diversity and range of applications offered by the technology provide a wider array of choices than previously possible. The promise of the new technologies may only be fully realized if they are as inexpensive and efficient as possible. Artificial barriers to their application, whether they be economic or otherwise, will inhibit their development in both the industrialized and the developing worlds.

C. CHANGING MARKET STRUCTURE

Technological developments also are having a significant impact on market structure. No longer can products be clearly delineated as belonging to one industry or another. A wide variety of companies sell data processing/telecommunications services either as adjuncts to their traditional lines of business or as entirely new offerings. In addition, an array of new entrants to the telecommunications industry continues to appear.

Although the United States remains the largest and generally the most mature market, the world market is growing at a substantial rate. It has been estimated that the global market for telecommunications equipment alone (\$40 billion in 1980) will be approximately \$90 billion in 1990.³ Telecommunications and information products and services are the third largest component of U.S. exports and are expected to grow throughout the next decade.⁴

Equally significant is the role that these technologies play in supporting other industries. For example, banking and insurance operations rely increasingly on telecommunications and computer equipment and services to function efficiently and provide new products. The

³ Little, Arthur D., Inc. *World Telecommunications Study II: 1980-1990*. Cambridge, Mass., 1980.

⁴ U.S. Congress. House. Committee on Government Operations. Subcommittee on Government Information and Individual Rights. *International Telecommunications and Information Policy*. Hearings, 97th Cong., 1st and 2d Sess., Dec. 2, 1981 and Apr. 29, 1982. Washington, U.S. Government Printing Office, 1982, p. 77-78.

ability of service industries to compete in international markets depends on the availability of effective telecommunications and data processing services. As the service sector of the economy becomes more critical in our balance of payments, the importance of efficient and cost-effective information transfer process will grow concomitantly. Also important is the potential role of information technology in revitalizing the traditional "smokestack" industries. Through the use of computers and telecommunications for streamlining production processes and customizing output, it is hoped that these industries can counter some of the growing competition from abroad.

D. CHANGING DOMESTIC POLICIES

Existing legal and regulatory frameworks are being reassessed in light of the changes wrought by technological advances and the dynamics of the marketplace. Traditionally, the telecommunications industry was highly regulated and consisted of only a few major providers of equipment and services. However, actions by Congress and the Federal Communications Commission (FCC) over the last several years have sought to promote increased competition in the field. (See Section II.)

Underlying these efforts is the belief that easing market entry and decreasing price regulation will promote a growing number of competitors and help foster technological innovation, new products and services, and lower costs for consumers. This will, in turn, enable U.S. telecommunications firms to remain competitive internationally and provide a stimulus for domestic economic growth.

The effect of these domestic policies on the U.S. international telecommunications posture is already evident. Several recent decisions by the FCC and legislative initiatives in Congress were intended to promote competition among United State providers of international telecommunications services. In some ways, this reflects an effort to keep our international position in conformity with our domestic stance. In other ways, it seems a natural outgrowth of a domestic policy which promotes a diversity of suppliers of telecommunications goods and services. These enterprises are now looking to the rapidly expanding international marketplace because of the growth potential it offers. Finally, there is the belief among some policymakers that what has worked domestically can work in a similar fashion on a worldwide basis.

These views are not accepted universally, however, and the debate continues over the applicability of the procompetitive approach to the international setting. It is generally recognized that international telecommunications and information policymaking must consider the perspectives of other nations and cannot be forced upon those with different philosophies. The essential involvement of other nations in establishing international telecommunications links ensures that U.S. domestic policies cannot be applied unilaterally. Furthermore, international information and telecommunications questions involve additional foreign policy and trade considerations absent from the domestic setting. On the other hand, it has been noted that while it would be inappropriate for the United States to attempt to impose its policies on foreign nations, they similarly should not be able to force their

ways of operating on the United States. As the impact of U.S. domestic telecommunications and information policies on the international scene continues to be felt, the debate over the limits of their applicability may be expected to intensify.

E. FOREIGN GOVERNMENT ACTIONS

The governments of our major trading partners and the less developed countries are attempting to harness the benefits of modern data processing and telecommunications technology and vie for a portion of the burgeoning international marketplace which is currently dominated by the United States. In some cases, they view computer and telecommunications issues as part of a broader spectrum of information technology opportunities, national industrial policies, or international affairs. In others, they focus on specific problem areas, such as the development of indigenous industries or the maintenance of national security.

Whatever their individual concerns, however, they share a growing recognition of the importance of telecommunications and other information technologies for economic growth and national standing. These countries respond in a number of ways to the changing technological scene. Several nations have embarked upon national programs to stimulate development of domestic industries and support exports of local products. Some have studied the range of issues involved and sought to develop policies to cope with the problems arising from the introduction of telecommunications and computer technologies—for example, in such areas as computer security, personal privacy, and cultural identity. Others have erected a variety of barriers to the flow of information and made entry to their markets extremely difficult for foreign competitors. Finally, there is some indication that a few nations are moving away from their traditional monopoly stance and supporting the development of private competition to the existing government suppliers of telecommunications services.

The result is a patchwork of activity by foreign entities, in some instances seen as favorable to the policies of the United States and in other cases considered harmful both to the position of the U.S. Government and to the economic opportunities for U.S. enterprises. Careful analysis of these actions and effective responses to them will be increasingly important if the United States is to prevent erosion of its position in international telecommunications.

F. CONCLUSION

International telecommunications is in a state of transition with new policies under development in the United States and abroad. Rapid technological advances offer the opportunity for new products and services, new entrants into the marketplace, reduced costs, and expansion of modern technology on a global basis.

Policymakers are presented with an opportunity to exploit the potential brought about by these developments. To do so, however, would necessitate overcoming the constraints of some existing government and regulatory structures and developing innovative approaches to the emerging world environment. There have been some suggestions that

the United States attempt to respond by imitating what has been successful for other nations. Other observers believe that while there may be lessons to be learned from the approaches pursued by other governments, U.S. responses will need to reflect the unique character of this Nation and the dynamics of our domestic economic and political scene.

A thorough understanding of the fluctuating international environment, the reasons behind the actions of foreign countries, and the foundation of U.S. successes in international telecommunications may be increasingly important if both the U.S. public and private sector are to successfully expand the opportunities offered by information technology. The creative melding of those policies and traditions which have enabled the United States to become a leader in telecommunications and data processing with fresh approaches reflecting new technological opportunities may provide the basis for a more effective U.S. posture in the future.

The following sections will focus on selected areas of concern to policymakers today. It is not possible within the context of this report to cover all issues or analyze every element comprehensively. It is hoped, however, that in identifying key issue areas this overview will provide a framework for continued debate on international information and telecommunications policies, illustrate the interrelationship between the subjects involved, and highlight alternatives for future action.

II. GLOBAL STRUCTURE

The world telecommunications environment is in a state of flux. While some fundamental approaches by individual countries and international organizations remain firmly entrenched, other concepts regarding international telecommunications are coming under increased scrutiny and being modified. As technological advances continue to offer new opportunities, traditional approaches to the provision of international telecommunications and information services may need to be reexamined. In addition, new methods for ensuring the accountability of governments, international institutions, and providers of facilities and services may need to be established.

A. COMPARATIVE APPROACHES

The United States formulates telecommunications and information policies in a different manner from other countries. Foremost is the fact that in this Nation, the private sector is the basic provider of telecommunications services and facilities. Efforts by Congress, the courts, and the Federal Communications Commission to increase competition in the U.S. telecommunications, data processing, and information industries in recent years accentuate the differing posture of the United States.

In contrast, while there is some evidence of governments in Western Europe and Japan "privatizing" certain elements of their telecommunications activities, most basic telecommunications facilities are either government owned or operated. Foreign telecommunication administrations (commonly referred to as PTTs—postal, telegraph, and telephone) remain in almost all cases the primary actors in establishing international telecommunications links. Thus, because United States enterprises in effect control only half of the circuit in any international connection, changes in international telecommunications policies can be neither formulated nor implemented in a vacuum. At the same time, because a substantial portion of worldwide telecommunications traffic is generated by the United States, this Nation does have considerable leverage in the international telecommunications arena.

B. FOREIGN RESPONSES

Recent actions in several countries reflect some attempts to liberalize the existing telecommunications regime. In 1981, the United Kingdom passed the British Telecommunications Act which opened up competition in certain equipment and service markets. The creation of Mercury Communications as a major competitor to British Telecom, the PTT in the United Kingdom, and Mercury's recent authorization to provide end-to-end service through direct access to INTELSAT offer

additional evidence of Britain's desire to foster competition. While the extent to which this liberalization trend continues is uncertain, a foundation for broadening the provision of telecommunications facilities and services has been created.

In other countries—notably Japan—the governments have studied and taken initial steps toward reducing the monopoly position of their PTTs in an effort to increase efficiency of operations and improve service offerings. While these actions appear to be positive signs that countries other than the United States are beginning to recognize the advantages to be achieved by a more competitive marketplace, the monopoly authorities in many countries remain firmly in place.

The effect that these changes may have on the ability of U.S. suppliers of equipment and services to compete effectively in certain foreign markets remains unclear at this time. For example, while some countries may wish to promote competition domestically among their own industries, they may, at the same time, choose to limit competition from foreign entities. In addition, these nations may continue to be reluctant to support international competition in telecommunications and information facilities and services, preferring instead to support the status quo. Concerns over the potential loss of revenues caused by dividing international traffic among a number of U.S. service providers, coupled with the lack of desire to deal with numerous foreign correspondents, also may continue to hinder U.S. firms in achieving international operating agreements.

A further element in the international telecommunications and information scene is the active role being taken by the European Community (EC). The EC hopes to establish a community-wide market for telecommunications and data processing products and services. In a series of reports and recommendations, the Community has outlined its strategy for establishing common European standards and strengthening its telecommunications and information industries.⁵ While these actions by the European Community are aimed at reducing barriers between its member countries and coordinating their divergent national policies, they also may limit further the ability of foreign entities—specifically, Japan and the United States—to compete effectively in Europe.

Another element of the European situation revolves around the EC Commission's responsibility for enforcing the Treaty of Rome rules on competition. Recently, in December 1982, the Commission ruled that British prohibitions on retransmission of the continent of transatlantic data communications violated the Treaty of Rome.⁶ The decision, now under appeal, would liberalize the European telecommunications environment. How the Treaty of Rome provisions ultimately will affect the competitiveness of the European telecommunications and information marketplace remains unclear at this time.

Given this changing and disparate environment, the United States may be faced with reassessing its posture toward foreign entities in the

⁵ Ramsey, Thomas J. Europe Responds to the Challenge of the New Information Technologies: A Teleinformatics Strategy for the 1980's. *Cornell International Law Journal*, v. 14, no. 2, summer 1981, p. 237-285.

⁶ Commission Decision of Dec. 10, 1982. *Official Journal of the European Communities*, no. L 360/36, Dec. 21, 1982.

areas of information and telecommunications. Both private industry and Government officials need to determine how to take advantage of the opportunities presented by new policies in foreign countries, while at the same time protecting U.S. enterprises from emerging restrictions on market entry.

Another element in the changing global structure is the effort by the U.S. Government to promote competition among providers of international telecommunications and information services. The ultimate consequences of U.S. procompetitive actions—both for U.S. industry and as it affects international operations—have not been fully assessed. A recent U.S. General Accounting Office report highlighted the need to monitor changing market structures to ensure that the objectives of Federal Communications Commission decisions designed to foster competition are achieved.⁷ For example, the development of appropriate safeguards to ensure that existing U.S. monopoly carriers and service providers do not foreclose opportunities for the entry of new firms into the market may be necessary to achieve effective competition. In addition, such things as accounting rates, subsidies, and equitable access to facilities may have to be reviewed and new guidelines established.

The possibility for foreign entities to exploit the deregulated U.S. environment to the detriment of American competitors also may necessitate careful analysis of the changing environment and the availability of mechanisms for confronting such problems. The recent proposals by the Nordic and Benelux countries to establish exclusive operating agreements for enhanced services with selected U.S. firms illustrated the potential adverse consequences arising from decreased regulation.⁸

C. COMPETITION IN INTERNATIONAL FACILITIES

The Communications Satellite Act of 1962 mandated the creation of an international communications satellite system. Interim arrangements for the establishment of such a system entered into force in 1964; definitive agreements became effective in 1973. Today, the International Telecommunications Satellite Organization (INTELSAT) has 109 member nations.

As international telecommunications developed initially, the United States accepted the monopoly-based telecommunications model favored by most of the world for establishing facilities, operations, and services. The United States has supported the INTELSAT global commercial satellite system and pursued a foreign aid strategy helping to ensure equitable access to this system by developing countries. The United States also has supported a cartel arrangement for the construction and operation of submarine cable facilities. Recently, however, the FCC has acted to open up alternative facilities arrangements through its transborder decisions and to increase competition among U.S. service providers through deregulation, authorization for the Communications Satellite Corporation (COMSAT) to provide services directly to end users, and consideration of such concepts as cost-based access to INTELSAT and open Earth station ownership. This is

⁷ U.S. General Accounting Office, *FCC Needs To Monitor A Changing International Telecommunications Market*. Report to the Chairman, Subcommittee on Government Information, Justice, and Agriculture, Committee on Government Operations, House of Representatives, Washington, U.S. Government Printing Office, 1983. CED 83-92, Mar. 14, 1983.

⁸ *Ibid.*

prompting a reevaluation of the appropriate role and structure of COMSAT as the U.S. representative to INTELSAT and INMAR-SAT (International Maritime Satellite Organization) and as the monopoly provider of international satellite telecommunications services. In addition, it is raising questions about the future posture of the United States toward INTELSAT.

The changing environment is reflected by a growing number of domestic, regional, and transborder satellite systems which have emerged in recent years and have affected INTELSAT's role as the operator of the only global satellite system. The Arabsat, Palapa-B, and Eutelsat regional satellite systems provide examples of such developments. The FCC's approval of transborder satellite service applications in 1981 further illustrates this trend. In this instance the Department of State, in a letter from James Buckley, Undersecretary of State for Security Assistance, Science and Technology to FCC Chairman Mark Fowler dated July 23, 1981, reasserted support for INTELSAT, but also supported transborder services using domestic satellites in cases where (1) the global system could not provide the service required, or (2) the service planned would be clearly uneconomic or impractical using INTELSAT. In addition, new technical developments, such as fiber optics, and capabilities like the integrated services digital network (ISDN), have the potential for significantly enhancing the utility of submarine cable systems. As a result, new cable systems may provide efficient alternatives to satellite transmission and impact usage ratios between terrestrial and space systems.

Most recently, the application of a private firm (Orion Satellite Corporation) to launch a private international communications satellite facility heightened the debate over the concept of a single global satellite system. The Orion Satellite Corporation asserts that its proposal does not contravene either the Communications Satellite Act of 1962 because the Act contemplated alternative systems; or the INTELSAT agreement because Orion proposes a private facility, which would not offer public services as defined in the Agreement.⁹ COMSAT and INTELSAT officials claim in response that such a system would cause significant economic harm to INTELSAT and requires approval under Article XIV(d) of the INTELSAT agreement. They contend that the licensing by the FCC of such a satellite system would seriously erode the viability of the global system and would cause rates to increase for small users by serving only the high density routes.¹⁰ In addition, COMSAT asserts that were the FCC to authorize such service, it would act as a precedent for authorization of additional U.S. international systems and would make it difficult to forstall the proliferation of systems by other nations that could harm INTELSAT.¹¹ Orion has challenged the COMSAT and INTELSAT assertions, noting that neither organization has produced any evidence of potential damage and pointing out that, on a full system basis, there is little indication of the sort of subsidies INTELSAT claims exist.¹²

The debate over this proposal has focused attention on a number of issues concerning international telecommunications policy. Specifi-

⁹ Application of Orion Satellite Corp. File No. CSS-83-002-P (1983).

¹⁰ Application of Orion Satellite Corp. File No. CSS-83-002-P, Petition To Deny filed by Communications Satellite Corp., Apr. 15, 1983.

¹¹ Application of Orion Satellite Corp. File No. CSS-82-002-P, Reply of Communications Satellite Corporation to Opposition to Petition to Deny, May 10, 1983, p. 11-12.

¹² Letter to Deputy Secretary of State Kenneth W. Dam from Christopher J. Vizas, II, Orion Satellite Corporation, May 21, 1983, p. 2-8.

cally, it raises the question of whether and to what extent the United States wishes to pursue its free market economic philosophy in international communications. As viable technological alternatives emerge and economic pressures to reduce costs and increase efficiency grow, the United States may need to reassess and prioritize its policies toward international telecommunications facilities. In essence, the United States is confronted with how it should proceed in this movement from a monopoly to a competitive environment so that U.S. commercial and national interests are preserved, foreign policy objectives are maintained, and new opportunities are promoted.

U.S. policymakers are now faced with the need to reconcile the twin goals of increased competition and a foreign policy which has supported the INTELSAT global commercial satellite system. The dilemma centers on how the accomplishments of the INTELSAT system can be maintained, while at the same time achieving the advantages of economy and efficiency produced by competition. Specifically, alternative approaches may need to be evaluated for subsidizing telecommunications services for the developing countries, new pricing arrangements may need to be considered, and the facilities planning process may require review. In addition, the actions of foreign nations may need to be monitored more carefully, if the United States expects not to be preempted. To address such a challenge may involve the formulation of new approaches and the cooperative effort of both public and private sectors.

III. U.S. COMPETITIVENESS IN INTERNATIONAL TELECOMMUNICATIONS AND INFORMATION

The United States has led the world in developing, applying, and exporting modern information technology. As the use of data processing and telecommunications facilities and services increases in all sectors of society and the technology is applied to an expanding number of areas, its importance grows concomitantly. Many nations now recognize the value of telecommunications and information technology both for their domestic economic growth and for international trade. As a result, efforts are underway in several countries to formulate national strategies to increase their share of the international marketplace and to aggressively counter the traditional dominance of U.S. enterprises. U.S. policymakers are confronted with a need to assess how best to respond to this changing environment to ensure that the U.S. position not be eroded and that other nations not impose their market structure concepts on this Nation.

A. GROWTH OF MARKETS AND INTERNATIONAL TRADE

Adequate statistics do not exist to quantify precisely the worth of the "information technology industries"—both in terms of the industries themselves and their value to other sectors of the economy. However, existing figures do provide evidence of trends and an indication of the magnitude of trade involved. Some sources estimate that the combined computer and telecommunications market for equipment and services will be as much as \$500 billion by 1990.¹³ These industries are an increasingly important component in the U.S. balance of trade, with "earnings from information technology exports . . . rising from about \$4 billion in 1965 to \$30-35 billion in 1980."¹⁴ At the same time, however, imports of telecommunication, computer, and electronic equipment have increased with substantial inroads being made by foreign competitors into the American market.¹⁵

Statistics on the service industries, which rely heavily on telecommunications and information systems, likewise are limited, but reflect a similar upward growth trend. The role played by information technology in enhancing the efficient operation of multinational corporations and making them internationally competitive, is equally significant, although also difficult to quantify.

The picture presented is one of tremendous growth opportunities, but also one in which the United States can no longer rely upon its

¹³ Spero, Joan Edelman, *Information: The Policy Void*, Foreign Policy, No. 48, Fall 1982, p. 145.

¹⁴ Crawford, Morris H. *Competition, Cooperation, and Discord in Information Technology Trade*. Cambridge, Mass., Harvard University Program on Information Resources Policy, 1982, p. 3.

¹⁵ National Telecommunications and Information Administration. *Long-range Goals in International Telecommunications and Information: An Outline for United States Policy*. Report to the Congress of the United States, February 1983, p. 155-159. (Hereafter cited as NTIA Report.)

historical technological leadership to claim the dominant market share.

B. INCREASING COMPETITION FROM ABROAD

The increase in international competition in information technology can be attributed in part to the natural entry of other countries into a highly profitable and expanding economic sector. In addition, other nations have been able to capitalize on American innovations to develop commercial products with comparable or higher quality and value without a heavy investment in basic research and development. At the same time, however, actions by foreign governments to increase regulatory controls on telecommunications and information activities, erect protectionist barriers to this trade, provide government support for indigenous telecommunications and data processing industries, and develop national strategies for increasing their share of the world market are significantly affecting the ability of U.S. firms to maintain their predominance.

Examples of the above actions provide some illustration of the changing scene faced by U.S. competitors. National papers outlining the importance of information technology for national sovereignty and economic growth have been written in Japan, the United Kingdom, France, Canada, and Brazil. These reports highlight the need for government actions to take advantage of the opportunities afforded by the new technology and in several instances call for new legal and regulatory frameworks to deal with the resultant changes. The European Community has prepared similar strategy papers.

Extensive research and development efforts in Japan and several European nations marshal government support behind domestic information industries. Cooperative government-industry efforts often increase the effectiveness of these programs. Furthermore, promotion of exports through special financing arrangements provides foreign suppliers with an advantage, particularly in Third World markets where expendable capital is scarce. Finally, erection of both tariff and non-tariff barriers to information trade and data flows (discussed in more detail in section V) create a hostile environment for U.S. providers and users of telecommunications and information products and services.¹⁶

C. POSSIBLE U.S. RESPONSES

A number of avenues have been proposed to improve the U.S. competitive posture. These include such things as increasing bilateral negotiations; extending coverage of the General Agreement on Tariffs and Trade (GATT) to include trade in services; implementing reciprocal trade sanctions; providing support to the private sector through tax incentives, research and development funding, export financing, and relaxation of antitrust constraints; and establishing overall Government policies and strategies for international telecommunications and information.

Some observers of the growth of information technology worldwide contend that new "rules of the game" are necessary to provide a framework for fair competition. The United States has argued at interna-

¹⁶ For an extensive analysis of information technology trade see: Crawford, M., *Competition*, op. cit.

tional meetings that excessive regulation of data flows and high technology trade will inhibit economic growth and stifle innovation which would benefit all nations. At the same time, however, there is some concern that in order to ensure that such an open, stable environment exists, some new initiatives may be required.

A further option is, in effect, to do nothing. There are those who believe that the forces of the marketplace and the existing mechanisms for international trade should be allowed to function without interference. From this perspective, marketplace competition will provide the necessary incentives for fostering healthy industries and advancing U.S. interests. While the United States has benefited traditionally from a *laissez-faire* approach, there are those who argue that if this Nation does not take initiatives in international telecommunications and information policy, other countries will define the future for us.

One recommendation for preserving U.S. interests is the extension of the GATT to cover trade in services. Telecommunications and information trade problems could then be included under these provisions.¹⁷ At the November 1982 GATT Ministerial meeting, the United States proposed that study initiatives be undertaken in the areas of services, investment, and high technology trade in the context of their possible future inclusion in GATT agreements. The only agreement the United States could get, however, was for individual countries to prepare papers on services trade.¹⁸ A related effort is the United States initiative in the Organization for Economic Cooperation and Development (OECD) to begin to address issues involving barriers to trade in information and telecommunications services. Included here is a U.S. proposal for a "Declaration on International Data Flow" which would commit member nations to avoiding restrictions on international flows of data.

While there is substantial support for pursuing these efforts at the GATT and the OECD, there are also several limitations to this being the sole approach. Among these are the fact that negotiating a new GATT code will take many years, that this mechanism may solve only one element among many of the telecommunications and information trade issues, and that the United States position may be diminished if negotiations are initiated in an area where this Nation has a substantial lead.

Another remedy offered to address immediate concerns about barriers to trade in telecommunications and information is to require reciprocity in access to markets from our major trading partners. A great deal of debate occurred on this topic in the last several years and a number of legislative initiatives remain under consideration. At issue is how the United States can exert some leverage against other nations which engage in unfair trading practices, without resorting to protectionist measures which could have the effect of stifling open competition.

Legislative proposals which favored a sector-by-sector approach to reciprocity, while appealing in terms of their ability to respond to specific problem areas, were opposed by many, including the Reagan

¹⁷ See Spero article for explanation of the advantages of this approach.

¹⁸ Leeson, Kenneth W., and C. Randall Jacobson. Trade in Telecommunication Equipment and Services. In: Yurow, Jane H., ed. *Issues in International Telecommunications Policy: A Sourcebook*. Washington, The Federal Communications Bar Association and The International Law Institute of Georgetown University, 1983, p. 263-264.

Administration as potentially violating the GATT and fostering greater protectionism. Instead, the Administration and many in the private sector and Congress support pending legislation which would amend Section 301 of the Trade Act of 1974 to expand the President's authority to respond to unreasonable trade barriers in the areas of services and investment.¹⁹

Another group of proposals involves Government support for private sector competitiveness and increases exports through a combination of related actions. Included are such things as increasing tax credits for private research and development (R&D), enhancing Government sponsorship of R&D in high risk areas, reducing antitrust restrictions to allow for more cooperation among firms to perform R&D and promote exports, and improving export financing. These efforts, many believe, will provide a more favorable environment for U.S. enterprises to compete effectively with foreign firms. In this way, it is argued, the private sector will receive the requisite boost needed to ensure competitiveness without excessive Government involvement. In addition, it is believed that these types of efforts will go far in countering the imbalance caused by foreign governments providing direct support to their telecommunications and information industries.

Finally, many believe that the development of broad strategies and integrated national policies is necessary if the United States hopes to retain its international competitiveness in the high technology fields. According to one expert, "How the United States deals with the broader global issues of information technology may well be the predominant factor in determining the future of U.S. competitive strength in information technology trade."²⁰

Most recently, the proposal for a Department of International Trade and Industry reflects the desire to consolidate Government activities related to international trade and to provide a high level of focus for supporting private sector efforts to compete internationally.

Again, the question is whether the United States decides to take a passive, reactive, or proactive posture to the issues of international competitiveness in telecommunications and information. Arguments exist for each approach. Reliance on the traditional forces of the world economy and the consistently high level of innovation in the U.S. telecommunications and information industries may be sufficient to maintain a leadership position. On the other hand, specific responses to individual problems which emerge may need to be developed and mechanisms for implementing them put in place. Some experts argue, however, "If the United States does not lead the initiative toward a liberal [international] regime, no one else will."²¹

In addition, others assert that if the U.S. Government does not take some positive action in support of private industry, other nations will move ahead of the United States.

¹⁹ *Ibid.*, p. 266.

²⁰ Crawford, p. 74.

²¹ *Ibid.*

IV. UNITED STATES GOVERNMENT STRUCTURE

In the United States, more than in any other nation, Government authority for international telecommunications and information policymaking is dispersed among different departments and agencies. Within the executive branch the Department of State and the Department of Commerce have primary responsibility for international communications policy. In addition, other agencies including the Department of Defense, Department of Justice, U.S. Trade Representative, U.S. Information Agency, U.S. Agency for International Development, Department of the Treasury, and Office of Management and Budget—as well as the FCC and Congress—all play a role in international telecommunications and information policy development. This is a reflection of the diversity of issues and constituencies involved, the fact that information and telecommunications activities increasingly play a role in numerous Government operations, and the traditional American aversion to centralized Government control or planning. The situation is accentuated by two additional factors. First, in the United States the private sector plays a major role as developers of new technologies, providers of information systems and services, and participants in the decisionmaking process. Second, oversight and regulation of the domestic and U.S. international communications industry by an independent regulatory agency, the Federal Communications Commission (FCC), whose authority has been delegated to it by Congress and which is independent of the executive branch, further complicates the policy formulation process.

This decentralized approach allows for the expression of competing viewpoints and draws upon the expertise of numerous organizations. The lack of Government interference in private industry is credited as a critical factor in establishing United States predominance in the telecommunications and information fields. At the same time, lack of Government help may serve as a major deterrent to maintaining that lead. At issue is how the United States Government can most effectively be organized to meet the challenges this Nation faces from competition abroad. The need for U.S. Government strategies to respond to foreign actions and influence the proceedings of international organizations is clear. How to achieve a consensus on the best mechanism to accomplish this, given existing political realities and institutional inertia, is less clear.

A. PROBLEM AREAS CITED IN REPORTS AND HEARINGS

Although there is no general agreement on the specific organizational scheme which would best serve international telecommunications and information policy, there seems to be a consensus on the need to improve certain elements of the decisionmaking process. Studies

conducted by Congress, the executive branch, and the private sector raise basic concerns about the ability of the U.S. Government as it is currently organized to address effectively issues surrounding international information and telecommunications.²² They cite several problem areas where attention is needed regardless of the organizational structure employed.

According to some observers, the low priority given to international telecommunication and information policy matters has adversely effected consideration of these vital issues. They maintain that, despite a growing importance of information and telecommunications for economic growth, international competitiveness, and national security, these topics have not garnered the required attention from policymakers at the very top of both government and industry. The result is that mid-level bureaucrats have developed responses to policies directed by those at the top of foreign governments. These professionals, it is said, may lack a broad perspective on the issues involved and an ability to comprehend the kind of trade-offs necessary for effective policymaking. Others have suggested that in part, what may be needed is for leaders in the business community and the Government to increase their attention to the relationship between information and telecommunications policies and such critical elements as jobs, balance of payments, industrial growth, and international competitiveness. Without such recognition, it is argued, these issues may never receive the priority attention they warrant.²³

Related to the recommendation for high level attention is the call for additional resources to be allocated to telecommunications and information policymaking. At present, only a handful of specialists scattered throughout several Government agencies—many of them with other responsibilities as well—focus on international information and telecommunications issues. It has been asserted that funding cuts and staff reductions over the last several years at the National Telecommunications and Information Administration (NTIA) of the Department of Commerce have eroded that agency's ability to provide technical expertise and extensive policy analysis. Although some long term civil servants are involved in telecommunications and information issues at the Department of State, the development of a core of specialists is said to be hampered by the foreign service personnel system which regularly rotates officers and which traditionally has not recognized this type of expertise as valuable to career advancement.²⁴ Without highly qualified and consistent staff resources, the ability to gather needed data, monitor foreign and international activities, analyze policy options, respond to private sector problems, and prepare for international negotiations may be substantially hampered.

²² U.S. Congress. House. Committee on Government Operations. *International Information Flow: Forging A New Framework*; Thirty-second Report Together With Additional Views. 96th Cong., 1st Sess. Washington, U.S. Government Printing Office, 1980. (Report No. 96-1535.) (Hereafter cited as: *Forging A New Framework*); NTIA report; and Computer and Business Equipment Manufacturers Association. *International Information Flow: The Need for Flexibility*. Washington, July 1982.

²³ Homet, Roland S., Jr. *U.S. Policy and International Information Flows: Some Keys to an Integrating Perspective*. *Chronicle of International Communication*, v. 3, No. 2, April 1982, pp. 1, 6, 7.

²⁴ U.S. Congress. House. Committee on Foreign Affairs. *Authorizing Appropriations for Fiscal Years 1984 and 1985 for the Department of State, the United States Information Agency, the Board for International Broadcasting, the Inter-American Foundation, and the Asia Foundation, To Establish the National Endowment for Democracy, and for Other Purposes*. Report to accompany H.R. 2915, 98th Cong., 1st Session, May 16, 1983, p. 53.

Some agreement also exists on the need to clarify existing ambiguities in the delegation of authorities for international information and telecommunications policymaking. Government officials have themselves acknowledged that they are unclear at times how to parcel out the responsibilities as described in Executive Order 12046 which transferred telecommunications functions from the President to the Departments of Commerce and State in 1978.²⁵ A recurring theme at several congressional hearings over the last several years was the need to identify a single entity within the Government which has final authority for international telecommunications and information matters.²⁶ Many industry witnesses considered this vital for providing the private sector with a place to seek aid to problems and to offer input to the policymaking process.

Furthermore, the designation of one lead entity was viewed as serving both as an arbitrator and coordinator for the diverse constituencies and departments involved in the policymaking process and for considering issues within a broader context. It has been argued that "successful strategies and the policies they reflect will only emerge from careful coordination of the resources and expertise of a variety of government agencies and private interests."²⁷ One recent Government report reiterated the view that the United States can no longer afford to develop policies within the confines of discrete issue areas—such as trade or foreign policy—and must begin to provide a vehicle for integrating these concerns within broader policy frameworks.²⁸

B. ALTERNATIVE APPROACHES

A variety of remedies has been proposed for the organizational problems described in the above mentioned reports and hearings. In one approach, experts have advised that both international and domestic telecommunications and information matters be handled by the same government authority. They view the two areas as critically interconnected and advocate a closer connection in formulating all telecommunications and information policies. The recent proposal to create a new Department of International Trade and Industry which would have authority for telecommunications and information matters reflects the viewpoint that these issues should be pursued as a part of U.S. trade policy. Others contend that because international information and telecommunications issues are by their very nature part of broader foreign policy concerns, they must be viewed in a context beyond that used for domestic policymaking. In particular, the fact that the United States is only one player among many in the international scene is cited as a major reason for approaching international telecommunications and information policy development from a foreign policy perspective. Finally, some authorities maintain that only the establishment of some new independent entity or office within the

²⁵ Forging a New Framework, pp. 43-44.

²⁶ U.S. Congress, House, Committee on Government Operations, Subcommittee on Government Information and Individual Rights, International Data Flow, Hearings, 96th Cong., 2d Sess., Mar. 10, 13, 27, and Apr. 21, 1980. Washington, U.S. Government Printing Office, 1980; and

U.S. Congress, Senate, Committee on Commerce, Science, and Transportation, Subcommittee on Communications, International Telecommunications Deregulation Act of 1982, Hearings on S. 2469, 97th Cong., 2d Sess., June 14, 15, and 17, 1982. Washington, U.S. Government Printing Office, 1982.

²⁷ Forging a New Framework, p. 6.

²⁸ NTIA report, p. 77.

Executive Office of the President will be able to address adequately international telecommunications and information issues.

Another question that has been raised regarding government structure is the appropriate role of the Federal Communications Commission in making international telecommunications policy. As an independent regulatory agency responsible to Congress, the FCC is not a part of the executive branch and therefore not required necessarily to implement executive policies. Although the FCC was established to perform a regulatory role, its decisions in recent years increasingly have had significant policy implications. According to a recent General Accounting Office report, "the FCC has had to go beyond its traditional areas of expertise to consider foreign affairs, national security, and U.S. trade policy."²⁹ Some critics question the appropriateness of the FCC performing such expanded policymaking functions. Suggestions that a Presidential veto over certain FCC decisions be permitted or that the FCC's policymaking functions be removed and placed elsewhere in the executive branch have been offered.³⁰ Others have argued that since the FCC is making significant policy determinations, its resources should be enhanced to support this activity. Whatever the final determination of Government responsibility for international telecommunications, a reassessment of the role of the FCC in this area may be needed.

Specific recommendations for organizational changes range from the creation of a Special Ambassador, to the establishment of a new interagency coordinating mechanism, to the designation of one lead agency in the executive branch, to the creation of an office in the Executive Office of the President (EOP). In addition, many observers have noted the desirability of reorganizing responsibilities for international telecommunications and information within individual agencies, such as the Departments of State and Commerce and the U.S. Information Agency.

Each of these approaches has its advocates and opponents. At present, Congress is considering legislation to create a White House office for international telecommunications and information (S. 999), as well as an interagency committee for international telecommunications and information (H.R. 2527). In addition, language that would authorize the establishment of an Office of the Coordinator for International Communications and Information in the Department of State was added by the House Foreign Affairs Committee to the version of the State Department Authorization for Fiscal Years 1984-85 (H.R. 2915) passed by the House on June 9, 1983.

However the debate over U.S. Government structure is resolved the demand for policymakers to improve upon the existing modes of operation appears unlikely to diminish in the near future. As our major trading partners and the developing world begin to design national strategies and take multilateral actions to address the changing international telecommunications and information environment, the

²⁹ U.S. General Accounting Office. *The Federal Communication Commission's International Telecommunications Activities*; Report to the Chairman, Subcommittee on Government Information and Individual Rights, Committee on Government Operations, House of Representatives. Washington, U.S. Government Printing Office, 1982, p. 3. CED 82-77, Apr. 19, 1982.

³⁰ NTIA report, p. 81-92.

United States may need to reconsider various mechanisms for responding to this challenge. As one congressional report suggested:³¹

... The most compelling reasons for a fresh organizational start are probably not the mistaken actions or stumbling efforts by executive agencies, as troubling as those may be. Rather, they are the inaction and inattention of the executive branch to the problems confronting us: the unwritten reports, unanswered complaints, undeveloped policies, and unknown priorities. What has not been done plagues the United States far more than what has.

To be most effective, such a structure may need to combine the traditional American advantages of diversity with a cohesive strategy for pursuing U.S. priorities.

³¹ Forging a New Framework, p. 58.

V. TRANSBORDER DATA FLOWS

The varied policy concerns grouped under the heading "transborder data flows" are a reaction to changes wrought by the convergence of computer and telecommunications technologies and advancements in global communications. Today, intracorporate networks transmit data internationally to coordinate production of goods, develop marketing strategies, and provide efficient accounting and inventory control. In addition, service industries—such as banking and financial services—find computer and telecommunications networks critical for transferring needed information on a worldwide basis. As more enterprises rely on remote and distributed data processing, the volume of transborder data flows may be expected to increase concomitantly.

Government authorities are grappling with the implications of information technology for the growth of their domestic industries, overall economic development, and national sovereignty. On the one hand, nations hope to capitalize on the economic opportunities offered by modern technology by developing new indigenous industries and acquiring a share of the expanding international marketplace. On the other hand, policymakers are also concerned about the potential negative impacts of computers and telecommunications on their countries. Specifically, the right to personal privacy, the autonomy of individual nations, and the maintenance of cultural values are considered vulnerable in a world where rapid data transmission and satellite video distribution are commonplace. As a result of these concerns, a number of nations are taking actions to restrict the flow of information across their borders and limit entry of foreign firms into domestic markets. Barriers to transborder data flows emerge in a variety of ways and reflect differing national concerns and objectives. They may be categorized under: privacy, economic, national sovereignty, and cultural issues.

A. PRIVACY

The potential for abuse of personal data transmitted outside the country of origin received considerable attention over the last several years. Responding to the perceived threats of the new computerized era, a number of nations enacted (or are currently considering) privacy or data protection laws. Included in these provisions—which in the case of most European laws cover only automated files—are requirements for registration of public and private databanks as well as rights of access, notice, and correction. There is general agreement internationally that individual rights should be protected and fair information practices established. However, at the same time, there is some apprehension that privacy regulations requiring approval for the creation of data bases and the export of personal information might be

employed as tools to limit the operations of foreign firms in some countries. Of special concern is the inclusion in several European data protection laws of provisions to cover "legal persons" (i.e. corporations or institutions) as well as individuals. According to one analyst, "the detrimental effects of corporate privacy statutes may totally exclude United States firms from certain markets."³²

The expected ratification of the Council of Europe (COE) Convention on data protection in the near future highlights these concerns. While the voluntary guidelines established by the Organization for Economic Cooperation and Development (OECD) and the Council of Europe (COE) Convention limit the collection of personal data, restrict disclosure to authorized purposes, and allow for individuals to inspect and challenge their records, the COE Convention must be implemented through privacy legislation and may be applied to legal persons.³³

B. ECONOMIC

Economic restrictions on international data flows are more diffuse and little systematic analysis of them exists. They involve both tariff and non-tariff barriers designed to control the use of telecommunications facilities and regulate entry into indigenous markets. Included are such things as discriminatory pricing schemes, inconsistent technical standards, domestic processing requirements, monitoring of transmission content, and outright denial of market entry.³⁴ One area of particular concern to U.S. enterprises is foreign telecommunications regulations which restrict the use of transmission facilities. Efforts by European nations to limit or deny the availability of flat-rate leased private circuits and by the Japanese to restrict leased circuit connections to a single location within the United States raised concerns among U.S. suppliers of data processing and telecommunications services.³⁵

Canada's Bank Act of 1980, which requires that all data about Canadian customers of banks operating in Canada be maintained there, Brazil's restrictions on the import of foreign hardware and software, and Germany's Bundespost regulations calling for local processing of data all provide further examples of the movement by foreign governments to seek economic restraints to the open use of international telecommunications and data processing networks.

C. NATIONAL SOVEREIGNTY

Nations also perceive threats to their national sovereignty resulting from unrestricted international data flows. The storage and processing of data in computer systems located in other countries raises fears

³² Grossman, Garry S. Transborder Data Flow: Separating the Privacy Interests of Individuals and Corporations. *Northwestern Journal of International Law and Business*, v. 4, spring 1982, p. 5-6.

³³ Aldrich, Robert F. Emerging Issues in Transborder Data Flow. In: Yurow, Jane H. *Issues in International Telecommunications Policy: A Sourcebook*. Washington, The Federal Communications Bar Association and The International Law Institute of Georgetown University, 1983, p. 193-194.

For a history of the drafting of the OECD guidelines and the COE convention, see: Fishman, William L. *Introduction to Transborder Data Flow*. *Stanford Journal of International Law*, v. 16, 1980.

³⁴ For a listing of cases where U.S. firms have encountered specific barriers, see: *Forging a New Framework*, p. 13-19.

³⁵ Markowski, Joseph R. Telecommunications Regulations As Barriers to Transborder Flow of Information. *Cornell International Law Journal*, v. 14, No. 2, summer 1981, p. 287-331.

that access to critical information may be impeded, either inadvertently or for political purposes. France, Canada, Sweden, and numerous developing countries express concern over this "vulnerability" and the increased dependence on foreign businesses and multinational corporations for data processing services. In Sweden, a study concluded that special actions should be taken to ensure the security of vital information processing activities.³⁶ Today, a Vulnerability Board exists to assess the problems associated with the lack of control over vital data processing operations.

To some countries, what is at issue is not only national sovereignty, but also national security. Further, the fact that many data processing and telecommunications networks are run by multinational corporations over which nations have limited authority heightens the desire to impose restrictions on such operations. These sovereignty concerns are particularly significant for developing nations, which have extremely limited domestic capabilities for information processing. Section VII discusses the full range of developing country concerns.

D. CULTURAL

A final area of controversy involves the issue of mass media and efforts to control the content of international information flows. Some nations view the use of foreign databanks, the dominance of foreign media, and the broadcasting of news and entertainment programming which originates in foreign countries as threatening to their own cultural heritage. Today technological developments have expanded concerns over cultural erosion, resulting in a growing number of nations—both developed and developing—taking issue with the intrusion of programming and the dominance of databases from foreign sources.

Advances in information technology accentuate the traditional concerns about cultural erosion. As more voice and video transmissions are sent in digital form, it will be difficult to distinguish the type of information being sent. In particular, rapid progress toward implementation of direct broadcast satellite (DBS) systems is controversial because of their ability to beam signals directly into any region or country regardless of what terrestrial network exists. In addition, although the technology is continually improving, the potential for "spillover" of the signal into neighboring territory exists. As a result, requirements to receive prior consent from any country receiving DBS signals and to control the content of DBS programming are the subject of debate in Europe, the United Nations, and the International Telecommunications Union (ITU). After a number of years of deliberation, the United Nations General Assembly adopted a resolution in late 1982 recommending that DBS services not be instituted without approval of the receiving country.³⁷ Although the resolution has no binding authority, it may provide the basis for future conventions on DBS in both the United Nations and other international organizations.

E. IMPACT OF BARRIERS

The effect of barriers to international data flows are often difficult to quantify, but ample evidence exists that they can disrupt interna-

³⁶ Report of the Vulnerability Committee (SARK). Stockholm, Sweden, 1982.

³⁷ Text of U.N. Document on Satellite Direct TV Broadcasting. New York Times, Dec. 11, 1982, p. 6.

tional business operations and impede the development of future markets. In some instances, firms can factor the "costs" of these barriers into their operational expenses of doing business abroad. In other cases, the barriers pose impediments which make market entry unprofitable and limit the ability to offer certain products and services. Finally, the uncertainty created by the imposition of barriers makes firms reluctant to invest in new overseas operations, expand their markets, or risk offering new products and services.³⁸

For example, if foreign subsidiaries of a major corporation are forced to purchase local computer equipment and software, rather than connecting with a headquarters computer facility, the costs of processing information and the operational inefficiencies may be substantial. In addition, disruptions to efficient information exchange may diminish the ability to manage the company and market new products and services effectively. Thus, productivity may be reduced and opportunities for developing strategies lost. Financial services provide a case where the growth of an entire industry may be affected adversely by barriers to international data flows. "As the international payments system continues to automate, the negative impact of disruptions in communicating data will spread through the entire community of enterprises offering international banking and financial services."³⁹

Ultimately, general economic growth may be hampered by such impediments. While designed to counter the dominance of the United States in the computer, telecommunications, and service industries, these restrictions may slow economic progress by those nations seeking to build indigenous capabilities. Restrictive practices further may limit the potential opportunities for all participants in the emerging information marketplace by reducing innovation and productivity.

F. RESOLUTION OF DATA FLOW PROBLEMS

Because transborder data flow concerns encompass a broad range of issues, there is neither one policy statement nor one international forum in which these problems can be resolved. Although some experts have suggested that what is primarily at issue are trade considerations, others point to the significant legal and human rights elements involved. Currently, efforts to address the varied issue areas are underway through both bilateral and multilateral negotiations.

While other nations believe that a new regulatory framework may be necessary to ensure equitable opportunities and to protect all parties, the United States has been reluctant to advocate creation of legal structures which may prove restrictive in light of rapid technological developments and changing market dynamics. The United States has found its fundamental policies of free trade and free (uninhibited) flow of information criticized by foreign governments seeking to promote their own domestic industries and in international organizations where codes of conduct attempt to restrict information flows. While it is generally agreed that "the principles themselves should not be abandoned, . . . the strategy for their implementation requires improvement,"⁴⁰ according to a recent Government report. There is less

³⁸ Forging A New Framework, p. 23-27.

³⁹ Forging A New Framework, p. 25.

⁴⁰ NTIA report, p. 15.

agreement on what such a strategy should be or how it might be implemented.

As indicated in section III, there are suggestions that the GATT negotiations should be expanded to include trade in services. In addition, efforts are underway at the OECD to gain acceptance of a "Declaration on International Data Flow" and to pursue further study of both the economic and legal aspects of transborder data flows. At the ITU the United States continues to work actively to maintain the availability of private, flat-rate leased lines, as well as a flexible planning process for use of the orbital spectrum. At the United Nations, U.S. negotiators consistently seek ways to counter attempts to restrict the free flow of information and to support viable technical assistance programs for developing countries. Several bilateral efforts were undertaken as well to resolve specific transborder data flow problems encountered by United States firms.

These actions reflect the growing recognition that efforts may need to be undertaken on a number of fronts as the United States is faced with increasing restrictions on transborder data flows. The effective coordination of these efforts, analysis of relevant problem areas, establishment of priorities, and development of viable strategies remain key challenges for U.S. policymakers.

VI. SPECTRUM MANAGEMENT AND THE INTERNATIONAL TELECOMMUNICATIONS UNION

The electromagnetic spectrum and the geostationary orbit (GEO)⁴¹ are two critical finite resources in international telecommunications. As the demand for global communications increases and the number of satellites scheduled for launching grows, efficient management of these resources becomes more significant. The situation is accentuated by the fact that more nations and a variety of new services now vie for available allocations. While technological developments in such areas as frequency reuse and beam shaping continue to extend the use of the spectrum, the debate over how to disperse these resources most effectively and most equitably remains active.

A. THE INTERNATIONAL TELECOMMUNICATIONS UNION

The International Telecommunications Union (ITU), a specialized agency of the United Nations, serves as the international manager of the spectrum so that interference between telecommunications systems and services is avoided and standards are established for equipment and procedures. The ITU was created in 1932 when the International Telegraph Union and the International Radiotelegraph Union merged. Today it has 157 member nations and provides a forum where consensus on telecommunications matters may be reached.

The International Telecommunications Convention governs the ITU and is reviewed and amended at Plenipotentiary Conferences, which establish policies, formulate operating procedures, and elect officers. The most recent Plenipotentiary Conference was held in 1982. Between Plenipotentiary Conferences the Administrative Council meets yearly to formulate policies. Administrative conferences, regional and world, are convened to consider specific telecommunications topics.

The ITU contains four permanent organs. They are the General Secretariat, the International Frequency Registration Board (IFRB), the Consultative Committee for Radio (CCIR), and the Consultative Committee for Telephone and Telegraph (CCITT). The IFRB coordinates and records frequency assignments made by countries as a mechanism for preventing interference, although it has no enforcement powers. Study groups of the two consultative committees provide a technical forum for establishing standards and operational specifications in their respective fields.⁴²

As with most United Nations agencies, the ITU operates on the principle of one country/one vote and most decisions are made by

⁴¹ The geostationary orbit is an orbital path in the plane of the Earth's equator in which a satellite can be placed and remain fixed relative to a given point on the Earth. Most communications satellites operate in GEO.

⁴² For a history of the ITU, see: Coddington, G. A., and A. M. Rutkowski. *The International Telecommunication Union in a Changing World*. Dedham, Mass., Artech House, 1982, 414 p.

consensus. In recent years the controversy over methods for allocating spectrum and the relative equity of differing approaches has intensified. In addition, debate continues over other issues, such as the role of the ITU as a provider of telecommunications assistance to developing countries. To a certain degree, this is a reflection of the fact that developing countries—because of their numbers—comprise a growing majority of ITU members and they are anxious to see their perspective represented in ITU actions. Some authorities maintain that ITU proceedings are no more “political” than in the past and merely reflect the changing character of the membership.⁴³ Others assert that, in fact, the primary technical objectives of the ITU are being diverted by political confrontations.⁴⁴

B. SPECTRUM AND ORBITAL ALLOCATION ISSUES

A major debate exists over rights to frequencies and orbital positions in GEO and the method for allocating these resources.⁴⁵ The problem centers on whether assignments should be made on a first-come, first-served (*a posteriori*) basis or whether advanced (*a priori*) planning should be used for making allotments. Those arguing in favor of the first approach—in particular the United States and other developed nations—contend that assignments should be made in terms of a country's ability to use them. They assert that technological advancements will provide for continued expansion of these resources so that future users will have available frequencies and orbital positions. Rigid planning is viewed by this group as an impediment to such technological development. Those favoring the *a priori* approach maintain that the less technologically developed nations must be assured equitable access to both the spectrum and GEO and that unless allotments are rationed, latecomers will be precluded from accessing their share of these resources when they need them.

Although the United States has accepted the need for a degree of planning for some communications services, it has opposed detailed plans for both fixed and broadcast satellite systems. Two cases—the 1974 Maritime WARC⁴⁶ and the 1977 Broadcast Satellite WARC⁴⁷—often are cited as examples of *a priori* planning resulting in subsequent problems when systems were ready to be implemented. The technical limitations imposed by the 1977 Broadcast Satellite WARC are claimed by some to be causing significant difficulties for European countries now attempting to establish operational direct broadcast satellite (DBS) services. As a result, the United States promoted a flexible approach at the recent Region 2 Administrative Radio Conference on broadcasting satellite service.

How successful the United States will be in garnering support in opposition to rigid *a priori* planning remains unclear. Questions exist over how far the United States should be willing to go in accepting some type of advanced planning and whether the United States can

⁴³ Rutkowski, Anthony M. Report on the ITU Plenipotentiary. *Chronicle of International Communication*, v. 3, No. 9, November-December 1982, p. 1.

⁴⁴ NTIA report, p. 35-39.

⁴⁵ For a discussion of various approaches to orbit-spectrum assignments, see: Rothblatt, Martin A. The Impact of International Satellite Communication Law upon Access to the Geostationary Orbit and the Electromagnetic Spectrum. *Texas International Law Journal*, v. 16, spring 1981.

⁴⁶ Smith, Marcia. The 1979 World Administrative Radio Conference: Implications for U.S. Preparations for Future ITU Conferences and Space Services. CRS Report No. 81-201. Sept. 3, 1981, p. 35-36.

⁴⁷ Tobin Foundation. *Structural Issues in Global Communications*. Washington, 1982, p. 15-16.

demonstrate adequately to concerned developing countries that a flexible, evolutionary approach will benefit all nations. U.S. delegations to ITU meetings may be under increasing pressure to formulate innovative approaches to allocating frequencies and GEO to ensure that technological development is not stifled while fears over equitable access are assuaged.

C. PREPARATION FOR ITU MEETINGS

Several congressional committees in the last few years questioned whether U.S. delegations to ITU meetings were adequately prepared to accomplish this Nation's objectives and represent the interests of the private sector. Specifically, concern exists over the need for effective interagency coordination, selection of a delegation and its chairman in time to prepare adequately for the conference, adequate resources to support the delegation both in advance of and during the conference, sufficient input from effected private sector groups, and preparatory bilateral and multilateral meetings.⁴⁸

Some of these questions may be reflections of problems inherent in the broader Government structure for international telecommunications policy formulation as discussed in section IV. Others may reflect the lack of priority often assigned to international telecommunications conferences and inadequate awareness of the stakes involved in their outcome. The fact that delegations and chairmen are chosen generally for one specific meeting tends to create a lack of continuity between meetings and with other international telecommunications issues. In addition, as the character of some of the ITU meetings changes, it may be increasingly important to have delegates who possess political skills as well as technical expertise and to include staff with foreign language capabilities. Preparation for meetings also may have to include expanded advance bilateral and multilateral discussions to ensure that the perspectives of other nations are understood, opportunities are enhanced for presenting U.S. positions, and coalitions are built in support of U.S. proposals.

D. FUTURE U.S. PARTICIPATION IN THE ITU

Events at the 1982 Plenipotentiary in Nairobi, Kenya highlighted U.S. concerns over the future direction of the ITU and the viability of continued U.S. participation in the organization. The near expulsion of Israel, which had it succeeded would have been followed by the departure of the U.S. delegation, raised questions about the ability to achieve consensus on critical technical issues in an increasingly political environment. Further, the situation accentuated the criticisms about inadequate delegate preparation and focused attention on the fact that it may be more difficult for U.S. positions to be advanced in an arena where the majority of members approach international telecommunications from a different perspective.

⁴⁸ For an analysis of U.S. preparations for the 1979 WARC, see: Smith, Marcia. *The 1979 World Administrative Radio Conference*, op. cit.

U.S. Office of Technology Assessment. *Radiofrequency Use and Management: Impacts from the World Administrative Radio Conference of 1979*. Washington, U.S. Government Printing Office, 1982, 163 p. [Hereafter cited as "OTA report".]

For an analysis of U.S. preparations for the 1983 RARC, see: U.S. General Accounting Office. *U.S. Preparations for an International Conference on Broadcast Satellites*. Washington, U.S. Government Printing Office, 1983.

RECD 83-121, Mar. 4, 1983.

In the aftermath of the Plentipotentiary, renewed suggestions for seeking alternatives to the ITU were heard in a number of quarters. A report prepared by the National Telecommunications and Information Administration (NTIA) of the Department of Commerce outlined advantages and disadvantages to the United States withdrawing from the ITU.⁴⁹ An earlier report by the Office of Technology Assessment also discussed options for changing the structure of the ITU, including seeking revision of the voting formula and increasing regionalization of the ITU so that only those nations most directly affected would participate in particular decisions.⁵⁰ Other suggestions include creation of some new entity, perhaps in the mold of INTEL-SAT, for managing spectrum and orbit allocations and achieving consensus on technical telecommunications matters.

This reaction against the ITU was not universally shared. Some critics maintain that the problem lies not so much with the ITU as an institution, but rather with the way the United States develops and represents its positions at ITU meetings. They contend that the agenda of the ITU over the next several years will cover critical telecommunications issues and that the United States should take an active role in determining their outcome. One expert suggests that by widening the scope of the Government's policy framework and expanding the perspective of the participants in the U.S. policymaking process to incorporate the views of the new majority of developing countries in the ITU, the United States will be more effective in influencing the results of ITU proceedings.⁵¹

Whatever posture the United States ultimately takes toward the ITU—be it withdrawal, maintenance of the status quo, shifting of current approaches, or consideration on new alternatives—policymakers are faced with evaluating existing U.S. positions and assessing how differing approaches might best serve this Nation's interests. The ability of the United States to respond to the concerns of the developing countries and develop creative approaches to spectrum management may effect substantially the opportunities for influencing deliberations and maintaining an effective U.S. presence in the ITU.

⁴⁹ NTIA report, p. 60-66.

⁵⁰ OTA report, p. 137.

⁵¹ Coddling, George A., Jr. *The United States Policy and the International Telecommunication Union*. In: *New Developments in International Telecommunications Policy*. Washington. The Federal Communications Bar Association and The International Law Institute of Georgetown University, 1983, p. 34-37.

VII. RELATIONSHIPS WITH THE DEVELOPING COUNTRIES

The nations which comprise the "developing—or third-world" represent a variety of political philosophies, social structures, and cultural heritages and are at differing stages of economic growth. Despite their differences, the less developed countries (LDCs) share a recognition of the importance of data processing and telecommunications technologies for future economic development and their position in the world. They appear aware as well, that access to critical information may be as important for enhancing development as the acquisition of modern technology. Although substantial impediments exist to the successful incorporation of information technology in most developing countries, they have shown a commitment to becoming major stakeholders in the emerging "information age" and harnessing its benefits to spur the development process. At the same time, the LDCs appear cognizant of the pitfalls associated with this changing environment and the potential for exchanging their traditional political and economic dependence for another form of dependence based upon the suppliers of information goods and services.

A. INFORMATICS PROGRAMS AND POLICIES

A number of developing nations are taking actions to establish "informatics" programs designed to identify national policies and set priorities so that the advantages of information technology can be exploited successfully. It is estimated that more than 60 "informatics authorities" exist worldwide in various countries.⁵²

In some cases these nations are attempting to establish their own indigenous computing and telecommunications capabilities in an effort to decrease the need for imported products and services. Additionally, developing countries have shown particular concern about the erosion of their national sovereignty and cultural heritage because they lack an information and telecommunications infrastructure. As a result, several LDCs are establishing policies which would regulate the flow of data and technology into and out of their countries, as described in section V.

The informatics policies pursued by Brazil—a newly industrialized country—in recent years illustrate one approach to addressing these concerns and building a domestic computer and telecommunications industry.⁵³ The Brazilians established a regulatory framework which

⁵² Bernasconi, F. A. Opening address to the Intergovernmental Bureau for Informatics Conference on Transborder Data Flow Policies. Rome, June 1980.

⁵³ National Security Council of the Presidency of the Republic of Brazil, Special Secretariat of Informatics. *Transborder Data Flows and Brazil: The Role of Transnational Corporations, Impacts of Transborder Data Flows and Effects of National Policies*. Report to the U.N. Centre on Transnational Corporations, 1982, 370 p.

protects their nascent information industries, controls access to foreign data sources, and monitors international information exchange activities. Requests for importing equipment, software, and transmitting data must all be approved through a government agency, the Special Secretariat for Informatics, which bases its decision on national priorities for creating independence in information technology. The Brazilian proposal for using "gateways" for channeling information into and out of the country would create even greater government control and provide an effective method for tariffing information. Whether Brazil's approach succeeds or not remains to be seen, but it may serve as a model for other developing countries pursuing similar goals.

In addition to individual country responses, such as Brazil's, a number of regional efforts are underway for pooling resources to develop information and telecommunications capabilities. Regional satellite systems provide one example of this trend, which may be expected to continue in light of the high investment costs often involved in acquiring modern technology.

B. DEMANDS FOR A NEW WORLD INFORMATION AND COMMUNICATIONS ORDER

The call for a "New World Information and Communications Order" (NWICO) reflects the collective effort of the LDCs to acquire equitable access to the world's information and communications resources, as well as control foreign media reporting to and from their countries. While NWICO debates focused in the past on concerns over "cultural imperialism" and freedom of the press, today the issues reflect broader information and telecommunications policy objectives. From a developing world perspective, a NWICO is necessary "to achieve a balance between developed and developing nations that will enable the LDCs to become active participants in the world marketplace and partners in an increasingly independent world."⁵⁴ Thus, access to scientific and technical information, telecommunications facilities, and the distribution of the frequency spectrum are viewed as critical factors for development.

NWICO demands are evident in several international fora where the LDCs are pressing for increased technical assistance, greater funding for communications development projects, and more equitable allocations of information and telecommunications resources. The growing collective strength of the LDCs is being felt in fora such as UNESCO and the ITU, where the one nation/one vote system operates.

The 1982 ITU Plenipotentiary Conference serves as one example of the LDC's power to alter international telecommunications and information guidelines and regulations. The LDCs urged strongly that the ITU take an increased role in providing technical assistance in communications technology to developing countries. Despite opposition from the United States and other industrialized nations, new language was inserted in "numerous provisions of the ITU convention which emphasized the importance of development assistance."⁵⁵ As part of the U.S. evaluation of its role in the ITU discussed in section

⁵⁴ Bortnick, Jane. *International Information Flow: The Developing World Perspective*. Cornell International Law Journal, v. 14, No. 2, summer 1981, p. 344-345.

⁵⁵ Telecommunications Reports. Vol. 45, No. 46, Nov. 15, 1982, p. 6.

VI, policymakers may have to reassess the extent to which the ITU should offer technical assistance and the type of support this Nation should provide in these efforts.

C. TECHNICAL ASSISTANCE PROGRAMS

A number of technical assistance programs are supported by the United States both on a bilateral and multilateral basis. Specific projects are funded by several executive branch agencies; however, criticism still exists that these efforts are piecemeal, uncoordinated, not linked to our broader information and telecommunications policy objectives, and underfunded in light of U.S. promises for support made at international meetings.

Recent U.S. initiatives in technical assistance focus on projects which reflect practical objectives and where the United States maintains some control over dispersal of funds. For example, the United States proposed the establishment of an International Program for the Development of Communications (IPDC) at UNESCO in 1980, partially in response to UNESCO's MacBride Commission report on communications problems in the LDCs. The thrust of this initiative is to "help redress the imbalances in the world's flow of information through practical assistance and cooperation, while at the same time safeguarding the fundamental principles of freedom of information and communication."⁵⁶ It is still too early to evaluate the ultimate success of the IPDC, as well as the willingness of the U.S. Government to provide consistent financial support for the effort. While funding was gathered from several agencies to provide for U.S. bilateral contributions at the December 1982 IPDC meeting, an ongoing source of funds does not exist and there remains debate over the desirability of promoting the IPDC.

Another element of the U.S. approach to technical assistance is the increasing reliance on the private sector rather than the Government for underwriting training programs. The creation of a new U.S. Telecommunications Training Institute (USTTI), announced at the ITU Plenipotentiary, reflects this perspective. The USTTI is funded by contributions from U.S. private corporations and training is taking place in the United States during 1983 as part of the United Nation's World Communication Year. The Institute will train over 300 students from developing countries and "instruction is expected to cover all major aspects of radio frequency management, broadcasting, satellite, and conventional telecommunications and computer assisted information and communications systems."⁵⁷ This approach emphasizes that the private sector will benefit from its support of technical assistance programs because market opportunities will be ultimately enhanced. It is argued that in an era of Federal fiscal constraints and in fields such as telecommunications and data processing where the commercial sector plays a significant role, it is appropriate for the funding burden to be increasingly assumed by private contributions. Whether the private sector responds at a level that counteracts decreasing agency

⁵⁶ Harley, William G. *The IPDC: Can It Stay On Course?* In: *The Media Crisis, A Continuing Challenge*. Washington, D.C., World Press Freedom Committee, 1982, p. 71.

⁵⁷ *Headliners in the New Communications Development Show*. *Chronicle of International Communication*, v. III, No. 7, September 1982, p. 1.

budgets or supports U.S. Government objectives in this field remains to be seen.

D. U.S. RESPONSES

There may a growing coincidence of interest between the United States and the LDCs in information technology. On one level they provide expanding markets for firms which offer computer, telecommunications, and information products and services. On another level, if the LDCs are unsuccessful in harnessing the advantages of information technology to the development process, world economic growth may suffer and the resulting instability may harm all nations. Furthermore, the collective voting power of the LDCs is increasingly evident in such international arenas as the ITU where they can alter existing regulations and may substantially affect the ability of the United States to pursue its goals in international telecommunications.

To avoid these negative consequences may require a growing sensitivity to the special concerns and needs of the developing world. "Beneath the rhetoric of the New World Information Order lie substantive problems and legitimate concerns on the part of the developing countries."⁵⁸ To respond effectively to these problems may necessitate formulation of new programs and priorities, the development of reliable funding sources, and a greater awareness of the LDC perspective. "At the same time, the Western World must emphasize the importance of fundamental principles such as freedom of the press and demonstrate how modern technology can benefit, rather than harm, the interests of the developing world."⁵⁹ Increased reliance on private sector support in this area—while helpful and important for fostering expanded markets—is not a substitute for governmental efforts to establish policies, effective strategies, and coordinated programs. The success of the United States in effectively coalescing public and private efforts in this area may be a prerequisite for a positive future relationship with the developing countries which will benefit all nations.

⁵⁸ U.S. Congress, House, Committee on Energy and Commerce, Subcommittee on Telecommunications, Consumer Protection and Finance, Telecommunications and Information Products and Services in International Trade. Hearings, 97th Cong., 1st Sess., Apr. 29 and July 22, 1981. Washington, U.S. Government Printing Office, 1981, p. 82.

⁵⁹ Bortnick, p. 353.

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A GLOSSARY OF SELECTED TELECOMMUNICATIONS TERMS

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ABSTRACT

The following glossary provides a short definition of selected telecommunications terminology, agencies, and organizations, as well as a listing of key laws and Federal Communications Commission regulatory decisions.

A Glossary of Selected Telecommunications Terms

PREFACE

This glossary has been prepared to assist the lay person to obtain a working knowledge in the telecommunications field. It is not an exhaustive listing of telecommunications terminology, but rather is intended as an aid to provide a short definition of the more common economic, technical, and regulatory terms found in the broadcast, cable, and telecommunications common carrier fields. A listing of key laws and Federal Communications Commission regulatory decisions as well as selected agencies and organizations active in telecommunications is also included.

Jane Bortnick, Specialist in Information Science and Technology, Science Policy Research Division; Angele Gilroy, Specialist in Industrial Organization, Economics Division; and David Siddall, Legislative Attorney, American Law Division; were responsible for the selection and definition of these terms. Mark Jickling, Research Assistant, Economics Division; and David Anapolle, Student Intern, Science Policy Research Division; provided invaluable assistance.

A wide variety of telecommunications dictionaries, glossaries, and textbooks were used as reference aids in the compilation of these definitions.

I. DEFINITIONS

A

ACCESS CHARGE: a *tariff charged by an *exchange carrier to an *interexchange carrier for the use of its local exchange facilities.

AMPLITUDE MODULATION (AM) RADIO: audio transmission utilizing *frequencies from 540 to 1600 kilohertz. (See *hertz.)

AMERICAN TELEPHONE AND TELEGRAPH 1956 CONSENT DECREE: a judicial settlement ending the Federal Government's 1949 antitrust suit against AT&T and Western Electric. Among the provisions was a restriction that the *Bell System engage only in the manufacture of equipment and the provision of services related to regulated *common carrier telecommunications services and those services incidental to the provision of such services.

AMERICAN TELEPHONE AND TELEGRAPH 1982 CONSENT DECREE: a judicial settlement ending the Federal Government's 1974 antitrust suit against AT&T, Bell Labs, and Western Electric. Among the provisions agreed to were the divestiture of the local *exchange service and access functions of the 22 *Bell operating companies as well as the modification of the *AT&T 1956 Consent Decree so that the remaining *Bell System may enter into unregulated markets (e.g. *data processing).

ANALOG DATA: information represented in the form of continuously variable elements. The normal mode of transmitting telephone or voice signals has been analog, although increasingly digital encoding is taking place.

ASCERTAINMENT: the *Federal Communications Commission policy which requires broadcast stations to determine the needs of communities served and provide programming to address those needs.

AUTOMATIC DATA PROCESSING (ADP): the processing of information by computers.

B

BANDWIDTH: the *frequency width used by a communication's *signal. Bandwidths are specified in *hertz.

BASIC CABLE SERVICE: the package of *cable television programming made available to all subscribers to the service without the charging of additional payment. (See *pay cable.)

BASIC TELECOMMUNICATIONS SERVICES: the *Federal Communications Commission definition of *common carrier transmission services which only result in the movement of information and do not involve the manipulation or restructuring of such information. (See *enhanced telecommunications services.)

BELL OPERATING COMPANIES: the 22 wholly-owned telephone companies within the *Bell System which presently provide local and intrastate telephone service.

* An asterisk preceeding a term indicates that the term is defined elsewhere in the glossary.

Under the terms of the *American Telephone and Telegraph 1982 Consent Decree these 22 companies and their *exchange service and *exchange access functions will be divested from the *Bell System.

BELL SYSTEM: American Telephone and Telegraph Co. and its subsidiaries, the *Bell operating companies, the major providers of the Nation's local and intra-state telephone service; AT&T Long Lines, the largest interstate telephone network; Western Electric, the leading manufacturer of telecommunications equipment; Bell Laboratories, a provider of research and development services which is jointly owned by AT&T and Western Electric; and AT&T International, the international arm which markets Bell System products and services outside the United States. The *AT&T 1982 Consent Decree calls for the divestiture of parts of the Bell System.

BIFURCATION: the *Federal Communications Commission plan to divide *Bell System *terminal equipment into two categories, new and used equipment. All equipment in inventory or installed prior to January 1983 is categorized as used and will remain the property of the *Bell operating companies to be offered under regulation, while all new equipment, that is equipment offered after that date, will be deregulated and distributed through AT&T's unregulated subsidiary, American Bell Inc.

BIT: a contraction of the words binary digit. Information in digital computers is represented in binary form (0, 1). A bit refers to each binary sequence.

BROADCASTING SATELLITE SERVICE (BSS): a radiocommunications service in which *signals transmitted or retransmitted by space stations are intended for direct reception by the general public. This service may include sound transmissions and television transmissions, and in the United States generally refers to *direct broadcast satellite service.

BROADCASTS: over-the-air transmissions conveying programs intended to be received by the general public (in contrast to transmissions intended only for specific addresses, such as point-to-point *common carrier transmissions).

BUNDLED RATES: rates in which the various rate elements which comprise the service are consolidated thereby making them indistinguishable. (See *unbundled rates.)

C

CABLECASTS: transmissions conveying programs intended to be received only by cable subscribers and which are contained solely within the cable (in contrast to over-the-air *broadcasts).

CABLE FEES: a yearly charge paid by the *cable franchise operator to the local government which represents the franchised area of operation. The amount is usually a percentage of the *cable television operator's yearly gross revenues and is agreed upon by the cable operator and the local community, but subject to standards established by the *Federal Communications Commission, 47 C.F.R. §76.31.

CABLE FRANCHISE: an agreement by which a local government unit contracts with a *cable television company for the right to provide cable services to the community.

CABLE PENETRATION: the number of homes in an area which have opted to be equipped to receive *cable television as a percentage of all households with television.

CABLE POLE ATTACHMENT: the attachment of, or the laying of *coaxial cable to utility poles or rights-of-way owned or controlled by utility companies to enable the provision of *cable television service. The cable television company pays a charge for this access, and in the absence of state regulation, the *Federal Communications Commission regulates pole attachment rates, terms and conditions.

CABLE RATES: payments made by cable television subscribers to the cable company for the provision of *cable television service.

CABLE SUPERSTATION: a local television broadcast station whose *signal is retransmitted to *cable television systems via *satellite.

CABLE TELEVISION: a system that delivers multiple channels of video programming to subscribers through a *coaxial cable. Cable providers are locally franchised, but are also regulated on the Federal level and may be regulated on the State level as well.

CANDIDATE ACCESS: statutory obligation which requires broadcasters to afford all political candidates for Federal office reasonable access to the airwaves. Section 312(a)(7) of the Communications Act of 1934, as amended, 47 U.S.C. §312(a)(7).

CATHODE RAY TUBE (CRT): an electron-beam tube such as the picture tube in a television receiver.

CELLULAR MOBILE RADIO: a form of portable telephone service which allows mobile radio telephones to both initiate and receive calls with private line quality. A metropolitan area is divided into "cells" each served by a low power radio transmitter which is linked to other transmitters by computer.

CIRCUIT: a two-way communications path.

COAXIAL CABLE: a cable composed of an inner wire conductor surrounded by a hollow cylindrical conductor with layers of insulation between them. *Signals travel between the inner wire and the outer cylinder and do not radiate outside the cable.

COMMON CARRIER: in *telecommunications, a supplier that provides telecommunications services to the public, subject to State and *Federal Communications Commission regulation.

COMMUNICATIONS SATELLITE: a relay station that receives video, audio, data and other transmissions from *uplinks and retransmits them to *downlinks.

COMMUNITY ANTENNA TELEVISION (CATV): the original name for *cable television when service consisted primarily of transmitting over-the-air *broadcast signals in areas of poor reception.

COMPARATIVE RENEWAL: the process by which the *Federal Communications Commission considers the qualifications of an applicant wishing to renew a broadcast license relative to the qualifications of competing applicants.

COMPUTER HARDWARE: the mechanical, magnetic, electrical and electronic devices or components of a computer.

COMPUTER SOFTWARE: the sequence of instructions needed to guide the operations of a computer.

CROSS SUBSIDIZATION: the use of revenues or facilities of one product or service to allay the costs of another product or service.

CUSTOMER PREMISES EQUIPMENT (CPE): equipment located on a customer's premises which is connected to telephone company facilities to terminate or adapt that facility for customer use (e.g. a word processor or telephone receiver).

D

DATA PROCESSING: mechanical or electrical handling of data; sorting, collating, performing mathematical steps, storing, erasing, or printing.

DIGITAL DATA: information represented by a code consisting of a sequence of discrete elements.

DIRECT BROADCAST SATELLITE (DBS): a high power *satellite in the *broadcasting satellite service which transmits programming directly to community receivers or to individual home receivers thereby eliminating the need to relay the program over cable or broadcast stations.

DISTANT SIGNAL: a broadcast *signal generally originating too far away to be directly received over-the-air in the community of concern. Cable companies may relay such a signal into their service area for carriage on one of their cable channels.

DISTANT SIGNAL RULE: the *Federal Communications Commission regulation, repealed in 1980, which limited the number of distant broadcast signals which cable systems were permitted to import into major markets. 47 C.F.R. §§76.59 (b)-(e), 76.61 (b)-(f), 76.63 (1980), repealed.

DIVISION OF REVENUES: the process by which revenues from interstate telephone service are shared among the *Bell System Companies involved in the provision of that service. (See *settlements)

DOMESTIC SATELLITE CARRIER: a carrier which provides intercity communications services within the U.S. via a domestic *communications satellite.

DOMSAT: a domestic (U.S.) *communications satellite.

DOWNLINK: a unidirectional transmission path from a *communications satellite to an *earth station. (Opposite of *uplink.)

E

EARTH STATION: an antenna, often saucer shaped, electronically equipped either to receive *signals from *satellites, to transmit signals back, or to do both. Television Receiver Only (TVRO) satellite dishes, which only receive signals, are used commonly by cable companies, and increasingly by individual homeowners.

ELECTRONIC MESSAGE SYSTEM (EMS): also referred to as electronic message service, any computer-based message system, such as electronic mail or electronic funds transfer.

ENHANCED TELECOMMUNICATIONS SERVICES: the *Federal Communication Commission definition of *common carrier transmission services which involve the manipulation, or alteration of *basic telecommunications service offerings (e.g. *data processing services).

EQUAL TIME: the statutory obligation which requires broadcasters to afford all political candidates for the same office equal opportunities to use a station's facilities if any one such candidate is permitted use. Section 315 of the Communications Act of 1934, as amended, 47 U.S.C. §315.

EQUIPMENT REGISTRATION PROGRAM: a *Federal Communications Commission (FCC) program initiated in 1977 which permits the connection of any supplier's *terminal equipment directly to the *telecommunications network once it has been registered and meets FCC technical standards, set out at 47 C.F.R. §68.

ESTABLISHED CARRIERS: the *common carrier firms which provide the Nation's *telecommunications transmission services under regulation; AT&T Long Lines, the *Bell Operating Companies, and the *Independent telephone companies.

EXCHANGE ACCESS: the connection of *interexchange carriers to the *exchange carriers' local *telecommunications network.

EXCHANGE CARRIER: a provider of *telecommunications *exchange service.

EXCHANGE NETWORK FACILITIES FOR INTERSTATE ACCESS (ENFIA) AGREEMENTS: *Federal Communications Commission approved contractually negotiated agreements between the *established carriers and *other common carriers (e.g. MCI) in which the other common carrier agrees to pay an approved *access charge to the established carrier to obtain access to the local network for the provision of end-to-end service.

EXCHANGE SERVICE: telephone service within a geographic area established by a regulated body which provides customers with the ability to originate calls within that local area, receive incoming calls, and obtain access to the *message toll network. Under the *AT&T 1982 Consent Decree service provided by a divested *Bell operating company which remains within a *local access and transport area.

F

FAIRNESS DOCTRINE: a series of broadcast regulations promulgated by the *Federal Communications Commission which requires broadcasters to 1) devote a reasonable amount of their programming to controversial issues of public importance, and 2) present contrasting views on such issues. Congressionally-recognized in section 315(a)(4) of the Communication Act of 1934, as amended, 47 U.S.C. §315(a)(4).

FIBER OPTICS: the technology for transmitting light in thin glass fibers. It can be used to carry relatively large amounts of information long distances.

FIXED SATELLITE SERVICE (FSS): a radiocommunication service between fixed *earth stations at specified points when one or more *satellites are used; generally refers to *communications satellite service.

FREQUENCY: a measure of the number of electromagnetic waves that pass a given point in a given time period. Frequency is equal to the speed of light divided by wavelength and is expressed in cycles per second or *hertz. A short wavelength is equivalent to a high frequency.

FREQUENCY ALLOCATION TABLE (NATIONAL): a table developed jointly by the *Federal Communications Commission and the *National Telecommunications and Information Administration which sets forth the division of *frequencies in the usable portion of the *radio frequency spectrum among domestic radiocommunication services.

FREQUENCY MODULATION (FM) RADIO: audio transmission using *frequencies from 88 to 108 megahertz. (See *hertz.)

G

GEOSTATIONARY ORBIT: an orbital path in the plane of the Earth's equator. A *satellite in geostationary orbit therefore remains fixed relative to the Earth.

GEOSYNCHRONOUS ORBIT: an orbital path at an altitude of 22,300 miles above the earth's equator. A *satellite in geosynchronous orbit completes one revolution of the earth at precisely the same rate as the earth makes one revolution on its axis, thereby staying at the same point relative to any point on the earth at all times.

H

HERTZ: a measurement of *frequency equal to one cycle per second. One kilohertz is 1,000 hertz; one megahertz is one million hertz; one gigahertz is one billion hertz.

HIGH DEFINITION TELEVISION (HDTV): a television system that utilizes significantly increased numbers of scanning lines on a screen compared to conventional television transmission methods. HDTV provides improved color fidelity and resolution as well as stereophonic sound.

I

INDEPENDENT TELEPHONE COMPANY: a firm which is not part of the *Bell System, but is the designated *established carrier for the provision of *telecommunications *common carrier service in a specific geographic area. There are approximately 1,500 such companies in the United States which provide 20 percent of the Nation's telephone service.

INDEPENDENT TELEVISION STATION: a commercial television station which is not affiliated with one of the three major television networks (ABC, CBS, NBC).

INTEGRATED CIRCUIT: a single piece of silicon on which any number of *transistors are directly etched along with the connections between them. This allows for whole sections of a computer, such as logic or memory components, to be contained within one chip.

INTERACTIVE CABLE SYSTEM: a *cable television system capable of transmitting *signals in both directions, thereby allowing viewer response or participation.

INTEREXCHANGE CARRIER: a provider of *telecommunications *interexchange service.

INTEREXCHANGE SERVICE: telephone service between a point or points located in one exchange area and a point or points located in another or multiple exchange areas. Under the *AT&T 1982 Consent Decree service provided between *local access and transport areas or service between a local access and transport area and a point outside that local access and transport area. (See *exchange service.)

INTERNATIONAL RECORD CARRIER (IRC): a carrier which formerly provided only international *telecommunications services other than voice communications (e.g. data, telex and facsimile). The *Federal Communications Commission however, recently ended restrictions limiting the IRC's to provision of record services and allowed them to offer voice communications as well. This decision (the *Overseas Communications Services decision), also removed the limitation on AT&T to provide only voice transmission, enabling them to offer data services also.

L

LASER: a tightly packed, narrow beam of light formed by the emission of high energy molecules.

LOCAL ACCESS AND TRANSPORT AREAS (LATA'S): geographic regions which represent the post-divestiture service areas of the 22 *Bell operating companies. All telephone service within a LATA is defined as *exchange service, while service between LATA's is defined as *interexchange service.

LOCAL BYPASS: refers to the use of an alternative telecommunications system to that of the local *established carrier's to gain direct access to customers inside a local exchange area.

LOCAL LOOP: a *circuit connecting equipment to a switching facility or distribution point.

LOW-POWER TELEVISION (LPTV): a television broadcasting service in which stations televise programs with less power than traditional stations. It is designed to reach a small geographic area, having a typical station coverage area of 12 to 15 miles.

M

MEASURED LOCAL SERVICE: a method of pricing local telephone service based on the number, the duration, the time of day, and the distance of calls within the local exchange area instead of by a flat all inclusive rate.

MESSAGE SWITCHING: the technique of receiving a message, storing it until the proper outgoing line is available, and then transmitting it.

MESSAGE TOLL SERVICE (MTS): a non-*private line intrastate and interstate long distance telephone service which permits local subscribers to establish two-way service on a message-by-message basis.

MICROCOMPUTER: usually a 8 or 16-*bit machine which can be used on a stand-alone basis or as an intelligent terminal; contains at least one *microprocessor plus other supporting circuitry.

MICROPROCESSOR: an *integrated circuit chip which contains the electronics of a central processor unit.

MICROWAVE: short electromagnetic waves in the *radio-frequency spectrum at 1000 megahertz or greater. Any form of *signals can be transmitted at these *frequencies between two line-of-sight points.

MIGRATION STRATEGY: a marketing policy which encourages customers to replace their presently installed equipment with upgraded alternatives (e.g. the purchase of electronic switching equipment to replace older, less versatile electro-mechanical equipment).

MINICOMPUTER: a small, programmable, general purpose computer typically used for dedicated applications.

MULTIPLE SYSTEM OPERATOR (MSO): the owner of more than one *cable television system.

MULTIPLEXING: the division of the transmission *bandwidth for use by two or more *signals, either by splitting the frequency band transmitted by the common channel into narrower bands, each of which is used to constitute a distinct channel (frequency-division multiplex), or by allotting the common channel to several different signals, one at a time (time-division multiplexing).

MULTIPOINT DISTRIBUTION SERVICE (MDS): over-the-air, line-of-sight transmission of information such as video programs by *microwave to subscribers with specially equipped receivers.

MUST CARRY RULE: the *Federal Communications Commission regulation which requires *cable television systems to carry *he broadcast *signals which are receivable over-the-air within the community served, 47 C.F.R. §§76.57-76.65.

N

NARROWCASTING: programming targeted to appeal to specific demographic or special interest audiences, as opposed to mass audiences.

NATURAL MONOPOLY: a market situation in which it is considered to be more efficient and economical for a product or service to be provided by a single firm under regulation, than by two or more competing firms. The provision of *telecommunications services was originally considered to be a natural monopoly market situation.

NETWORK AFFILIATED TELEVISION STATION: a commercial television station which is affiliated with one of the three major television networks (ABC, CBS, NBC), and while not required, broadcasts programming and commercials provided by the network.

NETWORK OWNED AND OPERATED TELEVISION STATION (O&O): a commercial television station which is totally owned and operated by one of the three national television networks (ABC, NBC, CBS). Although the *Federal Communications Commission allows a network to own 7 television stations, each television network presently owns five *VHF stations, the maximum number of VHF stations allowed. (See *Seven-Seven-Seven Rule.)

O

ONE-TO-A-MARKET RULE: the *Federal Communications Commission regulation which prohibits the common ownership within the same geographic area of more than a single broadcast station in the same service or of any radio broadcast station in the same area as a commonly owned television station, 47 C.F.R. §§73.35 (AM radio), 73.240 (FM radio), 73.636 (television).

OFF-NETWORK PROGRAMMING: television programming which has previously appeared on network stations and is now available for *syndication.

OTHER COMMON CARRIER (OCC): any carrier authorized by the *Federal Communications Commission to provide *telecommunications services in competition with the *established carriers (e.g. *domestic satellite carriers and *specialized common carriers).

P

PACKET SWITCHING: a data communications switching and transmission system whereby an input data stream is broken into uniform "packets" to which is appended addressing information, sequence counts, and error controls. Each packet is transmitted independently through the network so as to maximize the utilization of transmission facilities, and at the receiving end the individual packets are resequenced and combined as necessary into the output data stream.

PAYCABLE: cable programming, not part of the *basic cable package, available to *cable television subscribers for an additional monthly charge.

PAY-PER-VIEW-TELEVISION: a *pay television service for which subscribers pay on a per-program basis; that is the subscriber selects the desired programs and pays on a pay-as-you-watch basis rather than on a monthly subscription basis.

PAY TELEVISION: television service which is supported by direct payment by the viewers, versus commercial (advertiser supported) television, or *public television. Included in the pay television category are *multipoint distribution service, *paycable, *satellite master antenna television and *subscription television.

PERSONAL ATTACK RULE: the *Federal Communications Commission regulation which provides that when an attack is made upon the honesty, character, integrity, or like personal qualities of an identified person or group, during presentation of views on controversial issues of public importance, broadcast licensee must, among other things, offer a reasonable opportunity to the attacked person or group to respond, 47 C.F.R. §73.1920. (See *Fairness Doctrine.)

PETITION TO DENY: a petition filed by an interested person with the *Federal Communications Commission requesting that an application before the Commission not be granted. Section 309(d) of the Communications Act of 1934, as amended, 47 U.S.C. §309(d).

POSTAL, TELEPHONE AND TELEGRAPH (PTT) AUTHORITY: the term generally used to describe foreign telecommunications administrations. PTT's are both the regulators and providers of *telecommunications services and represent their governments in negotiations with foreign carriers and international telecommunications organizations.

PRIME TIME ACCESS RULE: the *Federal Communications Commission rule which prohibits *network affiliated stations in the top 50 television markets from broadcasting more than three hours of network or *off-network entertainment programming during prime time, 47 C.F.R. §73.658(k).

PRIVATE AUTOMATIC BRANCH EXCHANGE (PBX): a private automatic telephone exchange that provides for the transmission of calls to and from the public telephone network. Some PBX's now contain *microprocessors which make possible such services as direct-access inward dialing, automatic least-cost routing, speed calling, conference calling, and automatic ringing.

PRIVATE LINE SERVICE (PLS): a *telecommunications service used by high volume or special needs customers which offers a link between specific points solely for that customer's private use during specific time periods.

PUBLIC RADIO: noncommercial radio programming broadcast by stations which are supported by government funding, corporate and private donations, and other revenue sources.

PUBLIC TELEVISION: noncommercial television programming broadcast by stations which are supported by government funding, corporate and private donations, and other revenue sources.

R

RADIO FREQUENCY SPECTRUM: those *frequencies between the audio and visual ranges of the spectrum in which electromagnetic impulses can be radiated through space. This range is utilized for services such as communications, radar, earth resources sensing, and commercial radio and television.

RESALE CARRIER: a carrier which leases *circuits from a *telecommunications *common carrier and resells them to individual users for a profit.

SATELLITE, ARTIFICIAL EARTH: a manmade object which circles the Earth. A number of different types of artificial satellites are in operation today, including *telecommunications, broadcasting, weather, geodetic, navigation, reconnaissance, sensing, scientific, and manned satellites.

SATELLITE MASTER ANTENNA TELEVISION (SMATV): television systems that operate the same as *cable television systems, but are operated only on private property such as within apartment buildings and multi-unit condominiums. SMATV operators contract with property owners to supply television programming to homes on the property, as opposed to procuring franchises from local governments to use the public ways to supply such service to separate private homes.

SATELLITE SYSTEM: a space system using one or more artificial Earth *satellites.

SEMICONDUCTOR: a solid with an electrical conductivity that lies between the high conductivity of metals and the low conductivity of insulators. Semiconductor circuit elements include crystal diodes, *transistors, and *integrated circuits.

SEPARATIONS: the process by which telephone industry costs are allocated between interstate operations, subject to *Federal Communications Commission jurisdiction, and intrastate operations, subject to state regulatory authority.

SETTLEMENTS: the process by which revenues derived from the provision of joint interstate and intrastate service are allocated between the *Bell System and the *Independent telephone companies. (See *division of revenues.)

SEVEN-SEVEN-SEVEN RULE: the *Federal Communications Commission regulation which prohibits the common ownership within the United States of more than seven television (of which no more than five may be *very high frequency), seven AM radio, or seven FM radio stations, 47 C.F.R. §73.35(b)(1) (AM Radio), 73.240(a)(2) (FM Radio), 73.636(a)(2) (television).

SHARED USER: one of several users who in a non-profit arrangement, collectively subscribe to a *private line service of an *established carrier and in turn share the costs of obtaining that service.

SIGNAL: electromagnetic energy used to convey information.

SPECIALIZED COMMON CARRIER (SCC): a carrier which provides intercity *private line service in competition with the *established carriers.

SPECTRUM FEE: a proposed charge to be levied upon users of the *radio frequency spectrum, either in proportion to the *frequency space occupied or a percentage of profits realized. Proposals for use of such a "fee" or "tax" are generally viewed as methods for reimbursing the Government for associated regulatory costs and/or, for funding public broadcasting.

SUBSCRIPTION TELEVISION (STV): video broadcasting service available on conventional, over-the-air *very high frequency or *ultra high frequency television

channels with signals scrambled so that programs may be received only by subscribers with special decoding receivers.

SYNDICATED PROGRAM EXCLUSIVITY RULE: the *Federal Communications Commission regulation, repealed in 1980, which prohibited *cable television systems from retransmitting the syndicated programs carried on *distant signals which had been purchased by local broadcast stations if the local broadcast station requested deletion, 47 C.F.R. §§76.151-76.161 (1980), repealed.

SYNDICATION: the selling to individual television stations or cable systems of independent producer/supplier programming which may have previously appeared on network television.

T

TARIFF: a statement filed by a telecommunications *common carrier with the appropriate public regulatory agency which describes the service it offers and lists a schedule of charges for the use of that regulated *telecommunications service.

TELECOMMUNICATIONS: the transmission of *signals of any kind by wire, radio, optical or other electromagnetic systems.

TELETEXT: a one-way information system in which textual and graphic material is generally conveyed as part of the television broadcast signal or over cable.

TERMINAL EQUIPMENT: equipment capable of sending and/or receiving information over a *telecommunications channel and converting that channel for mechanical or human end use (e.g. switchboards, computers).

TRANSISTOR: a sandwich of semiconducting materials in which crystals are arranged to act as switches controlling the flow of currents throughout. Currently silicon crystals are the most common materials used.

U

ULTRA HIGH FREQUENCY (UHF): any of the *frequencies in the band between 300 and 3,000 megahertz. (See *hertz.) Television broadcasts on channels 14-83 use ultra high frequencies.

UNBUNDLED RATES: rates in which the various rate elements which comprise the service are separately stated, thereby enabling the identification of the charge for each component of the service. (See *bundled rates.)

UNIFORM SYSTEM OF ACCOUNTS: a *Federal Communications Commission prescribed accounting system encompassing both balance sheet and income statements accounts, used to review the operations of *telecommunications *common carriers under its jurisdiction.

UPLINK: a unidirectional transmission path from an *earth station to a *communications satellite. (Opposite of *downlink.)

USAGE SENSITIVE PRICING: a general term which refers to the charging for telephone service based on usage factors (e.g. duration and number of calls), in contrast to a flat fee charge. (See *measured local service.)

V

VALUE ADDED CARRIER: a carrier which leases *circuits from *telecommunications *common carriers and then adds special services, such as computer oriented services, before retailing the use of the circuits to a final user.

VERY HIGH FREQUENCY (VHF): any of the *frequencies in the band between 30 and 300 megahertz. (See *hertz.) Television broadcasts on channels 2-13 use very high frequencies.

VERY LARGE SCALE INTEGRATION (VLSI): the process of imprinting more than 5000 logic *circuits or more than 16,000 memory bits on a single chip.

VIDEODISK: a disk the size of a record album which stores large amounts of data, audio and video information in digital form.

VIDEOTEX: a generic term referring to computer-based information retrieval systems which display text and graphics on a video screen. Videotex encompasses the concept of *teletext (one-way retrieval systems), and *videotext (two-way or interactive retrieval systems).

VIDEOTEXT: a two-way computer-based information system in which the user is linked to the database by telephone line or cable. The system is interactive and users may send messages or perform transactions in addition to retrieving information.

W

WIDE AREA TELEPHONE SERVICE (WATS): a telephone service which allows a subscriber to make calls to specific geographic areas for a rate based on volume and time-of-day but generally less than that charged for *message toll service. Customers may also purchase "800" service which permits the subscriber to receive calls placed from specific areas with no charge to the caller.

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II. KEY TELECOMMUNICATIONS LAWS AND FEDERAL COMMUNICATIONS COMMISSION REGULATORY DECISIONS

ABOVE 890 DECISION: the *Federal Communications Commission decision concerning domestic allocation of *frequencies in the spectrum above 890 Megahertz, which is generally referred to as *microwave. The decision is most often cited for its conclusion that private point-to-point operations would be allowed frequencies in this spectrum, thereby creating alternatives to the *telecommunications *common carrier services then available and providing the basis necessary for competition in long distance telephone service. Allocation of Microwave Frequencies Above 890 Mc., Report & Order, 27 F.C.C. 359 (1959), reconsidered, 29 F.C.C. 825 (1960).

AUTHORIZED USER DECISION: the *Federal Communications Commission decision which removed the limitations on the *Communications Satellite Corporation (COMSAT) as a "carrier's carrier" which could supply *satellite *circuits only to other carriers. COMSAT is now able to lease satellite circuits directly to any user and is allowed to provide end-to-end services through a separate corporate subsidiary. Authorized User Policy, Report and Order, 90 F.C.C. 2d 1394 (1982).

CABLE COPYRIGHT LAW: provisions of the Copyright Act of 1976 which established limited copyright protection for broadcast programs on *distant signals which are retransmitted over cable. Under the statute *cable television concerns pay an established royalty fee for a compulsory license in lieu of purchasing rights to each individual program retransmitted. These fees are distributed to copyright claimants by the *Copyright Royalty Tribunal. (Sections 106, 111, 801 of the Copyright Act of 1976, 17 U.S.C. §§ 106, 111, 801.)

CARTERPHONE DECISION: the judicial and regulatory decision which established the right of telephone subscribers to attach privately-owned instruments to telephone company lines if the system is not thereby adversely affected. Carter v. A.T.& T., 365 F.2d 486 (5th Cir. 1966), decision upon remand, 13 F.C.C.2d 420 (1968), reconsideration denied, 14 F.C.C.2d 571 (1968).

COLUMBIA BROADCASTING SYSTEM, INC. v. DEMOCRATIC NATIONAL COMMITTEE (also known as the Democratic National Committee Decision): a 1973 Supreme Court decision most often cited for the court's holding that neither the *Communications Act nor the First Amendment requires broadcasters to accept or air paid editorial advertisements and that no private group or individual has a right to command use of broadcast facilities. Columbia Broadcasting System, Inc. v. Democratic National Committee, 412 U.S. 94 (1973).

COLUMBIA BROADCASTING SYSTEM, INC. v. FEDERAL COMMUNICATIONS COMMISSION (also known as the Carter-Mondale Decision): a 1981 Supreme Court decision in which the court upheld the constitutionality of a provision of the *Communications Act which requires broadcast stations to afford reasonable access to, or permit purchase of, reasonable amounts of air time by a legally qualified candidate for Federal office. The Court held that the statutory provision enhances First Amendment principles necessary for the effective operation of the democratic process. (See *candidate access.) Columbia Broadcasting Systems, Inc. v. F.C.C., 453 U.S. 367 (1981).

COMMUNICATIONS ACT OF 1934: the comprehensive Federal statute governing all communication by wire and radio. It was originally enacted in 1934; various provisions have been amended and added since then. The major substantive authority is Title II which governs wire communications, such as telephone and telegraph, and economic regulation of *telecommunications *common carriers generally (whether wire or radio) and Title III which contains provisions particularly relating to use of the *radio frequency spectrum, including broadcast radio and television. (Communications Act of 1934, as amended, 47 U.S.C. §§ 151 et seq.)

COMMUNICATIONS SATELLITE ACT OF 1962: the statute which authorized the establishment of the *Communications Satellite Corporation in order to facilitate the express policy of the United States to build and operate a commercial *communications satellite system in conjunction and in cooperation with other countries. (Communications Satellite Act of 1962, as amended, 47 U.S.C. §§ 701 et seq.)

COMMUNITY COMMUNICATIONS CO., INC. v. CITY OF BOULDER, COLORADO (also known as the Boulder Decision): a 1982 Supreme Court decision which held that local communities, when franchising *cable television operations, are not exempt from the Federal antitrust laws unless their action constitutes either action of the State itself in its sovereign capacity or municipal action in furtherance or implementation of clearly articulated or affirmatively expressed State policy (rather than action merely under local authority). Community Communications Co., Inc. v. City of Boulder, Colorado, 455 U.S. 40 (1982).

COMPUTER II DECISION (also known as the Second Computer Inquiry): the *Federal Communications Commission (FCC) regulatory decision which amended the regulatory scheme governing provision of regulated telecommunications services. The F.C.C. abandoned its previous regulatory scheme, which had been based upon distinguishing between "communications" services (which are regulated) and *"data processing" services (which are not regulated). The Computer II regulatory scheme, which went into effect on January 1, 1983, is based upon differentiating between *"basic transmission" services (which are regulated) and *"enhanced" services and *"customer premises equipment" (CPE), (which are not regulated). The F.C.C. required CPE charges to be *unbundled and sold separately. A.T.&T., the dominant carrier, was permitted to sell competitive services (such as enhanced services and CPE) only through separate subsidiaries. All carriers were required to keep separate accounts of their regulated basic service and their competitive services to prevent *cross-subsidization between the two. Second Computer Inquiry, 77 F.C.C.2d 384 (1980), reconsidered, 84 F.C.C.2d 50 (1980), further reconsidered, 88 F.C.C.2d 512 (1981), affirmed sub nom. Computer & Communications Industry Ass'n v. F.C.C., D.C. Circuit Court of Appeals, No. 80-1471, decided November 12, 1982 (slip opinion).

DOMSAT DECISION (also known as the Open Skies Decision): the *Federal Communications Commission decision which allowed any non-Federal Government entity, including the *Communications Satellite Corporation, *other common carriers, and noncarriers to construct and operate either individually or jointly *communications satellite facilities for domestic use. Domestic Communication-Satellite Facilities, First Report & Order, 22 F.C.C. 2d 86 (1970), Second Report & Order, 35 F.C.C.2d 844 (1972), modified, 38 F.C.C. 2d 665 (1972).

EXECUNET DECISIONS: Two decisions of the District of Columbia Court of Appeals which had the effect of approving competition in the long distance telephone market. In the first decision, the Court reversed and remanded the *Federal Communications Commission's decision not to approve *tariffs filed by Microwave Communications, Inc. (MCI), for its "Execunet" service. "Execunet" essentially provided an alternative long distance network for subscribers by allowing them to interconnect over the telephone lines with an MCI *microwave link to a distant city, then re-connect into the telephone system. In this manner, telephone calls could be made from phones in one city to phones in a distant city without utilizing the long distance lines provided by the *established carriers. The Court in its second decision required A.T.&T. to provide local physical interconnection with its network (which was essential to provision of end-to-end service). MCI Telecommunications Corp. v. F.C.C., 561 F.2d 365 (D.C.Cir.), cert. denied, 434 U.S. 1040 (1977) (Execunet I); MCI Telecommunications Inc. v. F.C.C., 580 F.2d 590 (D.C.Cir.), cert. denied, 439 U.S. 980 (1978) (Execunet II).

FEDERAL COMMUNICATIONS COMMISSION v. PACIFICA FOUNDATION (also known as the Seven Dirty Words or Pacifica Decision): a 1978 Supreme Court decision in which the Court upheld sanctions imposed by the *Federal Communications Commission (FCC) against a licensee for having broadcast a recorded monologue which was titled and repeatedly used "filthy words." The Court, taking into account that the broadcast was at a time of day (2 p.m.) when children could reasonably be expected to be in the audience, upheld the F.C.C.'s sanctions against the airing of "indecent" although not "obscene" language finding it to be within the statutory prohibition of "obscene, indecent, or profane language by means of radio communication" and not protected by the First Amendment. F.C.C. v. Pacifica Foundation, 438 U.S. 726 (1978).

HUSH-A-PHONE DECISION: the judicial and regulatory decision which established the right of telephone subscribers to use their telephone instruments in any manner so long as doing so is not detrimental to the telephone system. Hush-A-Phone Corp. v. United States, 238 F.2d 266 (D.C.Cir. 1956), decision upon remand, 22 F.C.C. 112 (1957).

MIAMI HERALD v. TORNILLO (also known as the Tornillo Decision): a 1974 Supreme Court decision in which the Court struck down a State statute which provided candidates with a right of reply to personal attacks printed in newspapers. Although the State statute appeared to be similar to broadcasting's *Fairness Doctrine, which had been upheld in 1969, in *Red Lion Broadcasting Co. v. F.C.C., the Supreme Court held that such a requirement applied to newspapers violated the First Amendment. Miami Herald v. Tornillo, 428 U.S. 241 (1974).

MICROWAVE COMMUNICATIONS, INC. (MCI) DECISION: the *Federal Communications Commission decision which granted the applications of Microwave Communications Inc. (MCI) to provide point-to-point communications services to subscribers in direct competition with the *established carriers. Microwave Communications, Inc., Decision, 18 F.C.C.2d 953 (1969).

NATIONAL BROADCASTING CO. v. UNITED STATES (also known as the NBC Decision): a 1943 Supreme Court decision in which the Court held that the "public interest" standard of the *Communications Act authorized the *Federal Communications Commission (FCC) to interest itself in general broadcast program format and kinds of broadcast programs aired by its licensees, and that in doing so

the FCC does not violate the First Amendment. National Broadcasting Co. v. United States, 319 U.S. 190 (1943).

OVERSEAS COMMUNICATIONS SERVICES DECISION (also known as TAT-4 Revisited): the *Federal Communications Commission decision which removed entirely the distinction between voice and record carriers, enabling the *international record carriers to provide voice service and AT&T to provide record services. C.C. Docket No. 80-632, decided December 22, 1982, released February 2, 1983, F.C.C. 82-547.

PUBLIC BROADCASTING ACT of 1967: the statute which provides for planning and construction assistance to public telecommunications facilities and demonstration projects, and established the *Corporation for Public Broadcasting to facilitate the development of public broadcasting. (Public Broadcasting Act of 1967, as amended, 47 U.S.C. §§ 390 et seq.)

RED LION BROADCASTING CO. v. FEDERAL COMMUNICATIONS COMMISSION (also known as the Red Lion Decision): a 1969 Supreme Court decision in which the Court upheld application of the *Fairness Doctrine, including the *personal attack rule. The Court held that the *Fairness Doctrine was within the authorized power of the *Federal Communications Commission to regulate radio in the public interest, convenience, and necessity, a standard established in Title III of the *Communications Act as amended, and reaffirmed by the Congress when amending Section 315 of the Act in 1959. The Court also held that the regulations enhanced First Amendment values "in view of the scarcity of broadcast *frequencies, the Government's role in allocating those frequencies, and the legitimate claims of those unable without governmental assistance, to gain access to those frequencies for expression of their views." Red Lion Broadcasting Co. v. F.C.C., 395 U.S. 367 (1969).

SPECIALIZED COMMON CARRIER DECISION: the *Federal Communications Commission decision which established the policy of approving applications for provision of *telecommunications services by new carriers. The Commission announced that it would approve competitive applications, rather than approving only one applicant and thereby creating monopoly service. This policy favored entry of new carriers to provide *specialized common carrier services. Specialized Common Carrier Service, First Report & Order, 29 F.C.C.2d 870 (1971), reconsideration denied, 31 F.C.C.2d 1106 (1971), affirmed sub nom. Washington Utility and Transportation Comm'n v. F.C.C., 513 F.2d 1142 (9th Cir. 1975), cert. denied, 423 U.S. 836 (1975).

UNITED STATES v. SOUTHWESTERN CABLE CO. (also known as the Southwestern Decision): a 1968 Supreme Court decision in which the Court sustained the jurisdiction of the *Federal Communications Commission to regulate the *cable television industry under the *Communications Act to the extent that such regulation is "reasonably ancillary to the effective performance of the Commission's various responsibilities for the regulation of television broadcasting." United States v. Southwestern Cable Co., 392 U.S. 157 (1968).

III. SELECTED TELECOMMUNICATIONS AGENCIES AND ORGANIZATIONS

COMMUNICATIONS SATELLITE CORPORATION (COMSAT): a private corporation created by the *Communications Satellite Act of 1962. COMSAT is the U.S. participant in the *International Telecommunications Satellite Organization and the provider of international *satellite services for communications between the United States and foreign countries. COMSAT also is the U.S. representative to the *International Maritime Satellite Organization and provides a variety of domestic satellite communications facilities and services. Three out of fifteen members of the Board of Directors are appointed by the President with the advice and consent of the Senate.

CONFERENCE OF EUROPEAN POST AND TELECOMMUNICATIONS ADMINISTRATIONS (CEPT): an organization of 26 European postal, telephone and telegraph authorities governed by a biennial plenary conference and two permanent commissions, one for postal matters and one for *telecommunications matters.

COPYRIGHT OFFICE: the Federal body that is part of the Library of Congress statutorily charged with the administration of the Federal copyright law. Areas of interest include *cable television, public broadcasting, *computer software, off-air recording, photocopying, and motion picture and sound recording piracy.

COPYRIGHT ROYALTY TRIBUNAL: the Federal body appointed by the President by and with the advice and consent of the Senate statutorily charged with, among other duties, the adjustment of *copyright compulsory license fees and the distribution of such collected fees to copyright claimants.

CORPORATION FOR PUBLIC BROADCASTING (CPB): a private, independent, non-profit corporation established pursuant to title II of the *Public Broadcasting Act of 1967 (P.L. 90-129), whose major function is to act as the administrative organization that distributes Federal funds for public broadcasting to assist local public broadcast activities. Members of the Board of Directors are appointed by the President with the advice and consent of the Senate.

FEDERAL COMMUNICATIONS COMMISSION (FCC): the Federal regulatory body appointed by the President by and with the advice and consent of the Senate with jurisdiction over all nongovernmental use of the *radio frequency spectrum (including broadcast radio and television) and interstate or foreign communication by wire (including telephone and cable).

INTERDEPARTMENT RADIO ADVISORY COMMITTEE (IRAC): a committee of representatives from 20 Federal agencies that assists the *National Telecommunications and Information Administration in the development of the National Table of *Frequency Allocations, the assignment of *frequencies to stations operated by the Federal Government, and other spectrum management functions.

INTERNATIONAL FREQUENCY REGISTRATION BOARD: the permanent organ of the *International Telecommunications Union which examines notifications of *frequency assignments from member nations for conformity with international radio regulations and provides advice regarding these regulations.

INTERNATIONAL MARITIME SATELLITE ORGANIZATION (INMARSAT): the global maritime *communications satellite system established in 1976. Commercial service began on February 1, 1982. There are 37 members to INMARSAT, including the *Communications Satellite Corporation which acts as the U.S. representative.

INTERNATIONAL RADIO CONSULTATIVE COMMITTEE (CCIR): the permanent organ of the *International Telecommunications Union in which member nations and recognized private operating agents formulate recommendations concerning technical and operational radio matters.

INTERNATIONAL TELECOMMUNICATIONS SATELLITE ORGANIZATION (INTELSAT): an international organization established in 1964 which owns and operates the global *satellite communications system. Today there are 106 members of the system.

INTERNATIONAL TELECOMMUNICATIONS UNION (ITU): the U.N. organization responsible for coordinating international *telecommunications, including spectrum management. It currently has over 150 member nations.

INTERNATIONAL TELEGRAPH AND TELEPHONE CONSULTATIVE COMMITTEE (CCITT): the permanent organ of the *International Telecommunications Union where member nations and recognized operating agents formulate recommendations concerning technical, operational, and *tariff aspects of international telegraph and telephone *telecommunications.

NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION (NTIA): the administration within the U.S. Department of Commerce, which serves as the principal advisor to the executive branch on *telecommunications matters. It manages the spectrum allocated to the Federal Government, facilitates more efficient Government telecommunications spending, and engages in research and policy planning.



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